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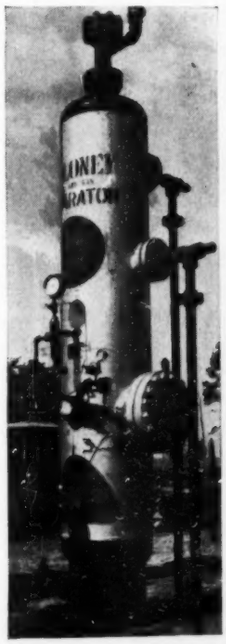

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Nordstrom 3" valves on central manifold at Ada, Oklahoma.

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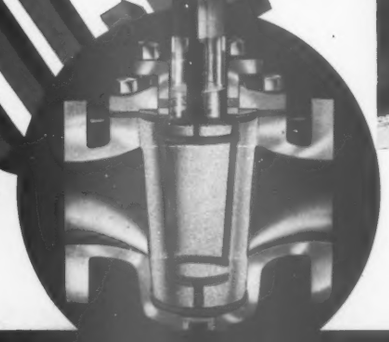

Nordstrom Valves on loading lines in gasoline plant in Texas.

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The Mission cylindrical or straight core is always in perfect contact with the body throughout its area due to grinding each core-half to the exact curvature of the body.

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Trends

Better Conditions Restore Prices in Large Texas Area

REFLECTING a "trend toward normal conditions" several buyers who last month brought an overproduction and an unsatisfactory refined-market situation in Southwest Texas to the attention of the entire industry through reductions in posted crude-oil prices, the first of this week restored the schedules previously in effect. The resumption of the old price schedules means advances ranging to 20 cents per barrel for a number of producers operating in the affected fields.

The action is interpreted as an indication of improved market conditions in Texas, a development which was brought about largely through action of the Texas Railroad Commission. The commission through emergency action taken the latter part of December and this month has brought the state's production within the demands, resulting in substantial withdrawals from storage. From November 30 to January 11 reduction in Texas crude-oil stocks totaled 3,295,000 bbl., and 2,200,000 of this total was withdrawn from inventories the last 3 days of December and the first 11 days of this month. This has resulted in more active competition for the crude oil in the fields which were affected by the price reductions last month.

CRUDE PRODUCTION *3,605,835 bbl. daily average—up 233,555 bbl. One year ago 3,644,592 bbl.*

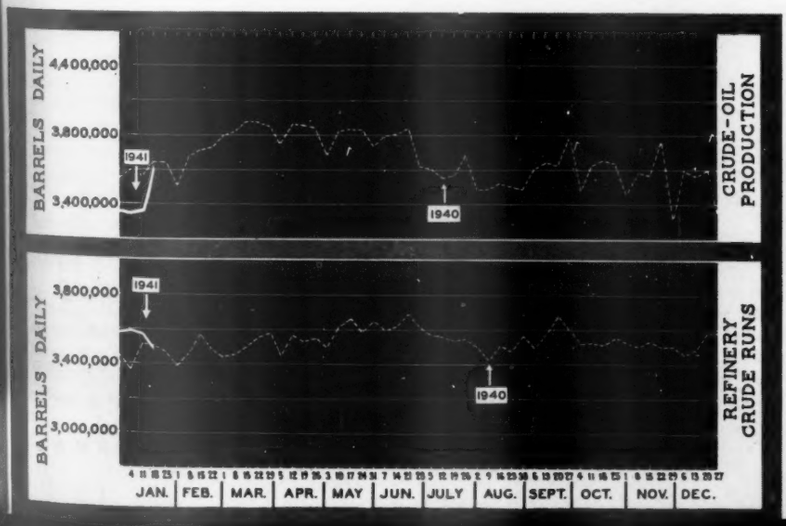
CRUDE STOCKS *259,342,000 bbl. as of January 11—down 1,301,000 bbl. One year ago 238,249,000 bbl.*

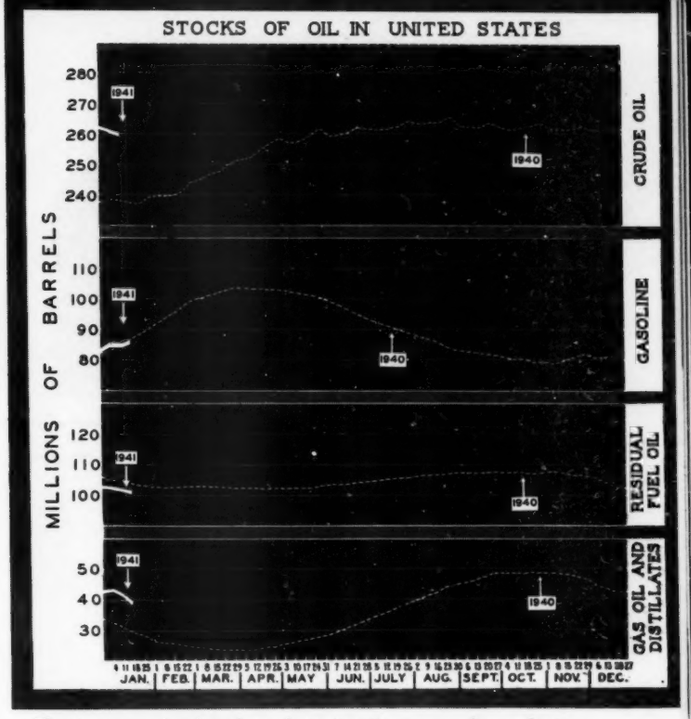
GASOLINE STOCKS *87,351,000 bbl. as of January 18—up 1,023,000 bbl. One year ago 87,574,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *101,213,000 bbl. as of January 18—down 1,068,000 bbl. One year ago 103,905,000 bbl.*

GAS OIL AND DISTILLATES *39,920,000 bbl. as of January 18—down 1,174,000 bbl. One year ago 29,505,000 bbl.*

REFINERY RUNS *3,490,000 bbl. daily week ended January 18 — down 75,000 bbl. One year ago 3,510,000 bbl.*





The improved refined-market situation was also a factor in the improved crude-oil situation. "Gulf Coast prices for some refined products have improved and we believe there is now a definite trend toward normal conditions," explained an independent refiner of the Gulf Coast area in announcing a return to the higher schedules. Reductions in tanker rates on coastwise movements and more inquiries for export have aided the position of the large and small refiners in the Gulf Coast section since the first of the year.

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 18, 1941	Bur. Mines Jan. est. of demand	January state allowables	Jan. 11, 1941
Arkansas	69,965	66,100	70,666	69,560
California	622,150	594,800	571,000	613,250
Eastern fields	111,500	114,800	.....	112,400
Illinois	323,200	340,300	.....	325,300
Kansas	199,200	191,000	194,000	189,000
Louisiana	291,940	287,400	292,756	293,680
North Louisiana	*69,040*	.....	.....	*68,830*
Louisiana Gulf Coast	*222,900*	.....	.....	*224,850*
Michigan	40,645	46,100	.....	40,790
Mississippi	16,935	15,200	.....	17,615
Nebraska	2,680	2,000	.....	2,290
New Mexico	102,750	100,000	104,000	104,010
Oklahoma	388,500	439,000	390,000	388,275
Rocky Mountain states	95,170	96,800	.....	95,660
Texas	1,341,200	1,297,500	1,370,000	1,120,450
East Texas	*375,100*	.....	.....	*301,275*
West Texas	*223,825*	.....	.....	*176,175*
North Central Texas	*138,450*	.....	.....	*120,300*
East Central Texas	*84,275*	.....	.....	*75,050*
Texas Panhandle	*72,025*	.....	.....	*71,525*
Texas Gulf Coast	*357,075*	.....	.....	*297,800*
Southwest Texas	*90,450*	.....	.....	*78,325*
Total United States	3,605,835	3,591,000	.....	3,372,286
Production January 1-January 18, 1941		61,723,240 bbl.		
Same period last year		64,839,978 bbl.		

Outside Texas there were few market developments of general significance. Fractional reductions have been made on some grades of furnace oils in the eastern United States. Stocks of gas oil and distillate are much higher at East Coast refineries and terminals than they were a year ago and for the entire country, as shown in the tables and chart on this page, inventories are approximately 10 million barrels greater than they were the latter part of January 1940. With the close of the main furnace-oil consuming season about 6 weeks away it is expected there will be a tendency to liquidate any excess stocks starting immediately. This policy may bring price concessions in other areas. Market students say this trend is preferable to that of a year ago when refiners as a group were short of gas oil and distillate and stepping up their plant operations in order to supply the deficit. The higher rate of crude runs to stills then was responsible for the excessive accumulation of gasoline stocks the first quarter of last year.

SPARKS . . . FROM THE NEWS

FAMILIAR STRATEGY: Delays sought in a permanent proration order for the Hawkins field, Wood County, Texas, are familiar. Tactics of obstruction had their field day in the early history of East Texas.

MORE COOPERATION: The Defense Commission wants more gasoline pipe lines built. Last week the I.C.C. indicated it may apply an arbitrary top percentage to earnings on all gasoline lines thus assuring that the new lines will not be built. More cooperation between units of Government is an outstanding need.

SYNTHETIC FUTURE: Oil has been made in the laboratory from cellulose. This research was intended to throw light on the origin of oil but by the time our reserves reach a dangerously low level, it may lead to the manufacture of oil on a commercial scale from this inexhaustible supply of raw material.

CONSOLATION: Curtailment of production in recent weeks has been hard for many operators to take in Texas. The restoration of crude-price schedules in several fields, after the entire state was threatened with a general cut, should be consoling.

TWO SIDES: Operators of gas-condensate wells and recycling plants are replying to the attacks on their operations. There are two sides to this knotty problem.

CORRELATION: Texas' Conservation Department has recommended a production scale for new wells based on production depths. It is another step in the effort to correlate allowables and production costs.

SPEAKING OF MONOPOLIES: Refiners in the United States have almost a monopoly on the production of 100-octane aviation gasoline. It is hoped that the Government will not become further confused and break it.

CALIFORNIA'S FIRST: After trying unsuccessfully to make a regular oil field at Paloma, operators in California have decided it will be the state's first distillate field.

JUST BEFORE THE DAWN: With Illinois and Michigan down 30 per cent from recent peaks and national demand steadily rising, brighter days are in prospect for Mid-Continent operators.

TOP POSITION: Because purchases of other countries have decreased while hers have increased, Japan has become this country's most important refined-product customer. This increases the significance of a possible complete embargo on oil shipments.

GOOD CUSTOMER: Just to test his daily output of engines one airplane manufacturer is receiving two 8,000-gal. tank cars of aviation gasoline daily. Refiners are trying to anticipate the consumption of the fleet of planes when it is in service.

CHANGE: Gas, although still junior partner to oil from a production standpoint, is becoming less of just something to be blown into the winds and more of a substantial revenue producer to Oklahoma operators.

FORERUNNER: Huge blocks of major-oil-company stocks sold over the counter last Friday and Saturday. Could it be that investors have heard of improved-demand prospects?

NAIVE: A defendant in the government suits against pipe lines takes the stand that it has a right to own stock in a profitable corporation. Now the courts will decide if this is a naive misconception.

STILL WELCOME: Illinois' new Governor Green urges a study of oil regulations for that state. While this has the aspects of closing the door after the horse is stolen, the action is welcome —there may be more horses.

THREE IN ONE . . .

One of Carter Oil Co.'s input wells in the Louden, Ill., pool, used for simultaneously injecting gas to three sands being repressured; approximately 1,350,000 cu. ft. are injected daily. The 1-in. macaroni string delivers gas to the lower or Bethel sand, the 2½-in. E.U.E. tubing delivers gas to the intermediate or Paint Creek stray sand and the 6-in. casing delivers gas to the upper or Weiler sand. Picture was taken shortly after a rainstorm

Pros and Cons of Proration Of Condensate Production

By EMBY KAYE
Vice President and Manager, Distillate Engineering & Processes Co.

THE application of conservation and proration principles to gas-condensate wells has become a matter of primary concern in Texas and Louisiana, and of interest to the industry generally. The output of recycling plants which are part of the complete operation of these wells has become an important factor in certain areas, resulting in demand from some that the conservation rules applying to these operations be changed and output curtailed.

In this article the author discusses several phases of this problem in relation to conservation and the general economic principles involved. Mr. Kaye has been connected with the development of recycling operations from their inception, and previously was in charge of large-scale refinery and natural-gasoline plant operations in the Mid-Continent area.

THERE has in recent times been an inordinate amount of publicity on the subject of condensate, or distillate, as it is sometimes called. Quite by coincidence this production comes entirely from the Gulf Coast and East Texas areas, where refiners depending on export and coastwise shipping have been under considerable pressure since shortly after the war began. On the one hand, they lost their export market and on the other, the war demand for tankers has resulted in high rates for coastwise service. The competition of motor fuels manufactured in condensate-recovery plants has resulted in a demand by an association of refiners in the Gulf Coast that condensate production and other derivatives of crude petroleum and gas by what is commonly known as a recycling plant, be restricted by law.

At the present time recycling plants operate by permission of the Railroad Commission in strict conformance with the gas laws of the state, which circumscribe the uses to which gas from gas wells may be put. For the Railroad Commission has held since 1934 that a condensate well was a gas well and has regulated the production from these wells in accordance with this opinion. The courts have sustained this view. As a result production from reservoirs of this type has been permitted if there was a legal market for the gas or if, after separation of the condensate, the dry gas was returned to the reservoir. In either case the net withdrawal from the reservoir has been limited to 25 per cent of the open-flow capacity of the wells. The commission's views were predicated upon the findings of outstanding technicians and scientists, including its own experts, that condensate was not a liquid in the reservoir but a vapor, or gas, and homogeneous with other gases in the reservoir, and that it was not a liquid until brought to the surface and reduced to a liquid.

Condensate is a liquid petroleum primarily in the motor-fuel range separated or extracted from gas-distillate gas wells. The Texas Railroad Commission has authorized the construction of recycling plants not only to permit recovery of condensate aboveground produced from gas-distillate gas reservoirs, but ostensibly because it realizes that only by the type of pressure maintenance involved in recycling can underground waste due to pressure drop be prevented. Several methods of extraction operating at high pressure were developed and have come into general use.

The exploitation of a condensate reserve involves first of all, of course, the drilling of producing wells and input wells. About one well in four is an input well. The input wells are those through which the dry gas is returned to the reservoir. Producing wells are connected to an extraction plant which, due to the high pressures at which such a plant must operate, represents a substantial investment, anywhere from an amount equal to the total cost of input and output wells to two times that amount.

In this plant the liquefiable portions of the gas are separated from the gas by cooling the gas and lowering the pressure to a certain extent, or they are extracted by means of an absorption oil which is contacted with the gas after which the condensate is distilled from the oil. At the same time any free gas components are expelled from the condensate by "fractionation."

The liquid recovered varies in character from field to field from a material of which more than 95 per cent is natural gasoline to one of which from 70 to 90 per cent is motor fuel, while the remainder may be largely kerosene distillate and natural gasoline. Butane and propane may be, and in some cases are, separated if the available content and a ready market justify the added expense.

The stable condensate is in the case of a number of plants delivered to crude-oil pipe lines which transport it to refineries for further processing into motor fuels and other products. In other situations, perhaps in most cases, either because the pipe-line carrier does not want the product or the plant operator does not desire to sell it at the prevailing price, which is frequently the price of 40-gravity crude oil, the operator chooses to "split" the condensate into its component parts and offer the finished products in a wider and more open market.

Condensate Products Good Quality

The products of condensate are by nature endowed with high quality. They are free from the ordinary impurities of gasoline produced from most crude oils. Thus the operator avoids a great many of the expenses common to the refiner who processes crude oil. He has no burdensome residual fuel and instead produces nearly 100 per cent motor fuel and other light oils. As a result he can and does produce his products at a lower cost than the crude-oil refiner. This lower cost enables

Condensate production is an airtight operation from start to finish. There is no waste in processing or handling because of the pressure equipment employed. Neither is there any underground waste

a number of the plants to offer their products not only in Texas, in the area hard by their processing plants, but also in the great Middle West.

Rightly or wrongly, new and particularly more cheaply produced motor fuel disturbs the channels of trade, and under present pricing practices doubtless influences in the long run the market price of the bulk of the gasoline in the affected areas, and frequently outside these limits. Doubtless motor fuels produced in East Texas from condensates have depressed the price of certain grades of gasoline in Chicago, and as a result diminished the returns to refiners in Oklahoma, Kansas, and Missouri. That is a reflection of competition, or the result, perhaps, of a long outmoded marketing philosophy. If individual refiners in Kansas and Oklahoma and Missouri have no posted price for their commodities based upon costs but instead employ a pricing system wherein, as here, the price is affected, not by cost or supply and demand but by the price at which a relatively few cars of motor fuel, already taken into account by the Bureau of Mines as part of the consumptive demand, are sold, that is no reason why the production of the raw material from which these fuels are produced in Texas should be prorated there.

A refiner in the producing areas of South and East Texas has no more proper grievance against the producer and "distiller" of condensate than he should have against a fellow refiner who by reason of ownership or location happens to have a higher-gravity crude with a greater gasoline content, or a crude yielding a high antiknock straight-run gasoline and a high-solvent-value naphtha, as a result of which he enjoys a higher income from his operations. There are also other factors which may give some refiners a higher net income than their neighbors. It may only be the larger denominator of a greater throughput. Certainly the output of the lower-cost larger plant should not be restricted to equalize costs between both types of plants, or it may be that owing to the circumstance of location, a better inbound rate on crude oil gives an advantage to one plant as against another.

During periods when natural gasoline, produced from casinghead gas or natural gas, is not readily absorbed by refiners and when as a result the price of this commodity slumps, some natural-gasoline manufacturers convert their product into motor fuel which directly competes with gasoline from the refineries. Or the product may go direct to jobbers for blending with motor fuel, in which case it also competes with products from refineries. Certainly it would occur to no one to suggest that because of the competition of this low-cost gasoline with refiners' products, natural-gasoline production should be restricted.

Proration and Waste Prevention

If condensate production needs to be restricted by means other than the controls now in effect, such action will have to be predicated upon a more fundamental basis than the mere fact that the products manufactured from condensate compete with those manufactured by the refiner from crude oil, to the disadvantage of the refiner. Let us, for the sake of argument only, admit that condensate is in competition with oil. In that case it displaces crude oil just as gasoline produced from casinghead and natural gas displace oil. Should condensate production be restricted therefore, and more or less on the same basis as crude oil?

There has never been a universally accepted theory of proration. Probably most of the elements of the industry have held the view that proration effectuates conservation. But beyond this general view there is no agreement. There are those who believe that when market demand is below available production, and this is the law in some states, production should be cut back because lower prices which usually follow in the wake of excess production result in the consumption of oil in fields where cheaper fuels can be used. The less-than-efficient use of the inherent potentialities in crude oil is considered wasteful. Restriction of production to prevent this waste is considered justifiable.

Another group considers that aboveground storage of crude oil and its derivatives in quantities in excess of those required to provide for anticipated consumption results in waste by evaporation, a view supported by the law in some states. Here proration of output is designed to hold stock levels to the estimated demand. Each of these theories has been criticized from time to time as the handmaiden of price fixing and on the grounds that conservation was only indirectly involved.

The more generally accepted theory of proration applied to crude oil is the restriction of production to prevent physical waste in the reservoir and in production methods. In some of the states, particularly in Texas, the regulatory bodies have the most enlightened knowledge of underground waste and have established rules to prevent it. This is probably the most equitable theory of proration for an economy which has not yet had price fixing imposed upon it as a national institution. If proration is predicated solely upon the proposition of preventing waste, the price of crude oil will be allowed free play according to supply and demand. This theory, of course, involves the principle that each field will be allowed to produce its maximum measured by a uniform yardstick.

However, in the interest of the ultimate good for the state it is wise to apportion the consumptive demand among the several states. As a matter of fact, in those states practicing legal production control, consumptive demand is taken into account in fixing the allowable production for a state. The Bureau of Mines determines the demand which is increasingly followed by the several states. In that determination it allows for the natural gasoline which will be used by the refiners, and then calculates the gasoline which will have to be produced from crude oil and other sources. In this way it takes into account the condensate production. In this way a home is made for condensate so that it does not become surplus production actively competing with crude oil for the same market.

Condensate production is an airtight operation all the way through. There is no waste in processing or handling because of the pressure equipment employed. There is no underground waste. On the contrary, the return of gas to the formation to conserve reservoir pressure prevents losses and waste in the reservoir. The pressure keeps the condensate in gaseous form so that it will be brought to the surface and condensed into a useful substance. If the pressure were allowed to drop, the condensate which condensed in the reservoir would be altogether lost. There would not be enough liquid to flow to the well bore.

Problems in Making Allocations

One of the unhappy facts about proration is the general dissatisfaction with allocations made among the various pools. Because it involves comparisons of unequal types of petroleum products, it would be more difficult to find a formula for making an allowable for a condensate field. Most condensate reservoirs will show from 500 to 1,300 bbl. to the acre, although several will run higher. Oil in place will run from 5 to 10 times as high even for lower depths than those at which condensate is found. If then an allowable were to be made on the basis of reserves, oil drills would pass by most of the reserves of this type.

An allowable would have to take into account reservoir pressures, capacity of wells, condensate content of the gas, character of condensate produced, because all these factors go into the economics of the enterprise. A given allowable for one well might permit it to operate while a like allowable for another well producing another type of condensate, from a lower gas and from a reservoir of higher pressure, would compel the operator to shut down the operation.

From an acreage standpoint—and acreage is increasingly being taken into account to prevent unnecessary drilling—condensate production is not out of line with crude oil. Several oil and condensate fields picked at random show the production, or the anticipated production, from typical fields of both types, as follows:

OIL

Field—	Allowable	Acres	Per acre
Luby	2,187	2,920	.75
Turtle Bay	925	840	1.10
Hastings	18,520	6,875	2.69
East Texas	352,695	132,000	2.65
North Cowden	9,923	16,160	.614
Yates	16,866	20,000	.843

CONDENSATE

Field—	Production	Acres	Per acre
Agua Dulce	7,700	10,000	.77
Long Lake	3,860	7,509	.51
Cayuga	1,520	13,700	.11
Cotton Valley	10,000	12,000	.83
Katy	5,000	11,285	.44
Stratton	1,200	4,500	.30

It is interesting to note—though it does not perhaps have any direct bearing upon the ques-

(Continued on Page 30)

NEXT WEEK

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Review and Outlook

The Annual Statistical Number will be at once a careful appraisal of the year that is just ended, and a critical inquiry into 1941.

Here you will find the answer as to what is the situation in regard to reserves—are they increasing or shrinking? The Journal's report on reserves is the only survey which shows how the data are compiled, based on new fields and extensions.

Here you will learn what representative oil men feel should be the industry's primary objectives for the year. Their views are candid, and considered.

Production, demand, refinery output, pipe-line activity, markets, exports, imports, prices—all are treated with customary Oil and Gas Journal thoroughness and authoritativeness.

In short, next week's issue will again afford the most complete report published of the industry's vital statistics.

Japan's Oil Purchases Expand As Embargo Threatens

By J. P. O'DONNELL

NEW YORK, Jan. 21.—If the U. S. Government extends its antitotalitarian policy to the extent of declaring an embargo on shipments of crude oil and refined products to Japan, this country's oil-export business would suffer a severe blow. Last November, the latest month for which official data on exports are available, Japan took 39 per cent of our refined-oil and 28 per cent of our crude-oil exports.

Summary of the most important refined products shows that of our total exports of 4,709,505 bbl., Japan took 1,816,881 bbl., or 39 per cent, thus outranking any other country as an importer of United States petroleum products in that month. Her total has grown steadily through the 6 months ended with November from a low of 775,612 bbl. in June, the month in which the major portion of our European market was lost. Her November 1940 imports of refined products from this country were 62 per cent higher than in November 1939, when they totaled 1,121,254 bbl.

In addition to these products, the Bureau of Foreign and Domestic Commerce November report shows that Japan was also the major buyer of lubricating greases, taking 2,844,773 lb. out of a total of 8,733,307 lb., or 37 per cent. Her importance with respect to petrolatum and petroleum jelly was even greater for she took 5,112,490 lb. of our total exports of 6,242,870 lb., or 81 per cent.

Japan's increased imports and the decline in our export totals have given the country an increasingly important role in our refined-products export market. In June of last year she accounted for 11 per cent of our foreign market, whereas in November her part was 39 per cent. In November 1939 her part was 15 per cent.

Japan's imports of United States crude oil in November were not exceptional when compared to previous months, but were 28 per cent of our total exports. Japan's imports of United States crude oil have not varied greatly in recent months and in November were less than in the same month of the previous year. Because of the loss of other markets, Japan's purchases of crude oil and refined products have become more important.

Summary of our November export market and Japan's importance in it is shown in the following table:

	Japan's imports* (bbl.)	All U. S. exports (bbl.)	Japan's per cent
High-grade gasoline	179,890	346,591	52
Other gasoline	586,157	1,548,106	38
Kerosene	0	174,946	0
Gas oil, etc.	724,171	1,178,502	61
Residual fuel oil	129,620	803,698	16
Lube oils	197,043	657,662	30
Crude oil	1,083,382	3,805,086	28
Total all oils	2,900,263	8,514,591	34

*From the United States.

There has been much agitation in this country for a total embargo on exports to Japan on the basis that we are now aiding a potential enemy, at least an "aggressor" nation against which we have a declared policy. The major deterrent to establishing an embargo is the effect it might have elsewhere, principally in the Netherlands East Indies. Japan has been carrying on negotiations with the Batavian government for months with the object of obtaining oil supplies. These negotiations have never proceeded in a manner wholly satisfactory to Japan and only recently she replaced the head of the commission conducting the negotiations. The first agreement was reached between the countries last fall when Netherlands East Indian oil companies contracted to supply 1,800,000 tons of oil to Japan in 1941. This is about 1,000,000 bbl. per month, compared to an average of 2,180,000 bbl. Japan has been taking from the United States for the past 6 months. The deficit indicates, possibly, the extent of the demands Japan would make on the Indies if further imports of United State oil were denied.

It may be significant that the contract consummated between the Netherlands East Indies oil companies and Japan last fall did not include aviation gasoline, Great Britain having previously contracted for the islands' production of this fuel. Included in Japan's November imports from this country were 180,000 bbl. of gasoline designated as "high-grade motor fuel." If this country denied these shipments to Japan there is little doubt that she would impose demands on the East Indies. This would have the probable result of either depriving Great Britain of a source of an invaluable war material or bringing about an invasion of the islands by Japan to enforce her demands. The Batavian government is reported to have provided for this emergency by mining all oil facilities. An invasion by Japan would likely result in the destruction of wells, pipe lines and refineries. Rehabilitation would require years. The loss of both United States and Netherlands East Indies supplies would pose a difficult problem for Japan.

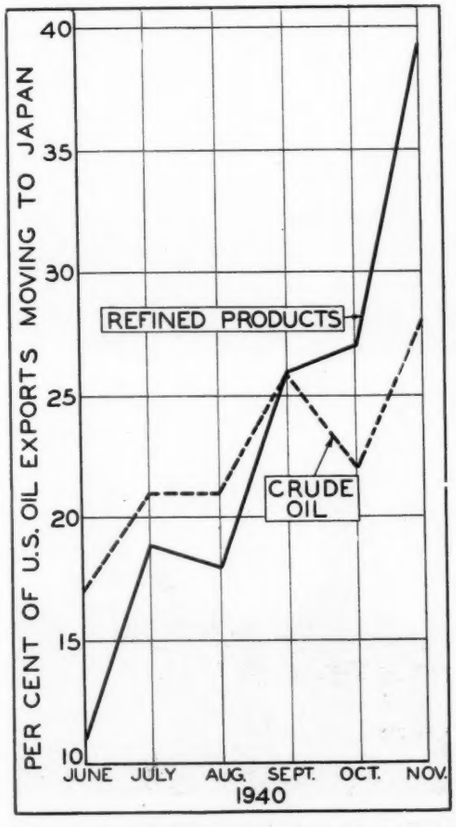


Chart showing Japan's importance in U. S. oil exports

An embargo on Japan would hit the California division of the domestic industry especially hard. The bulk of Japan's imports are supplied from the Pacific Coast. A comparison between Japan's imports of United States oil and exports of petroleum from California's two customs districts in November follows:

Product—	California exports (bbl.)	Japan's imports* (bbl.)
Crude oil	1,589,869	1,083,382
High-grade gasoline	139,212	179,890
Other gasoline	468,973	586,157
Kerosene	59,687	0
Distillate fuel oil	861,828	724,171
Residual fuel oil	440,241	129,620
Lube oils	66,549	197,043

*From United States only.

Obviously, no absolute conclusion can be taken from this comparison, for it is evident that some of Japan's imports are obtained from other sources. The comparison does indicate, however, that since Japan is California's most important foreign customer, the proposed embargo would have a sharp impact on the California industry.

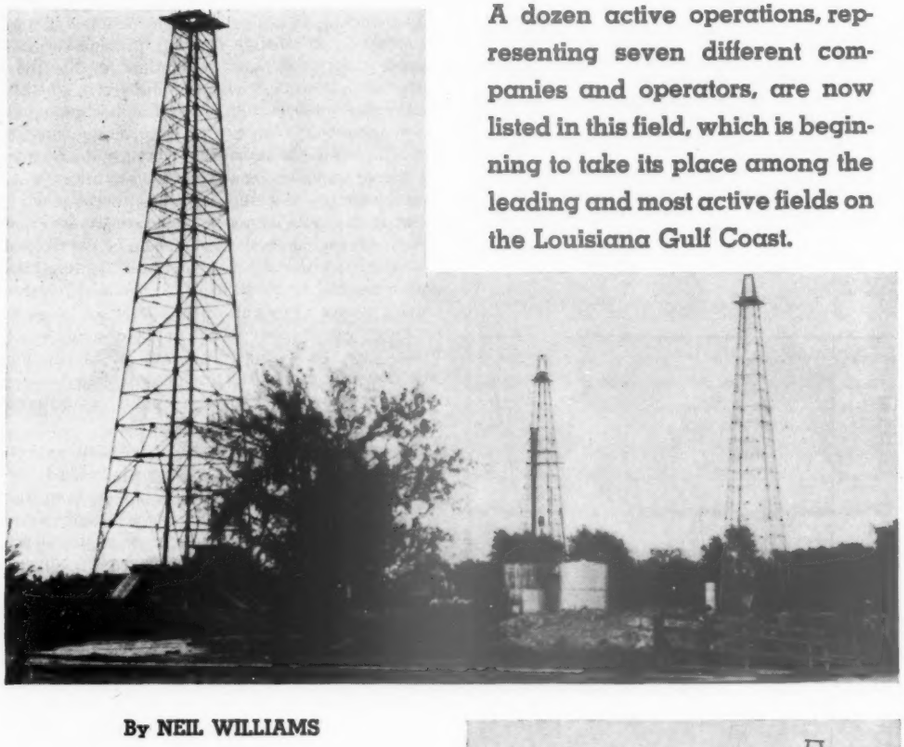
Except in the case of high-grade gasoline and lubricating oil the loss of this market in itself would not have a disturbing effect on the domestic oil industry as a whole. An increase of but 1 per cent in domestic demand for crude oil, motor fuel and residual fuel oil would practically offset entirely the loss of the Japanese market. Likewise, on the basis of the November export and domestic demand totals, the loss of Japan's distillate-fuel-oil demand could be offset entirely by an increase of 4 per cent in domestic demand.

UNITED STATES OIL EXPORTS TO JAPAN

(Data in barrels)

Refined products—	June	July	August	September	October	November
High-grade gasoline	5,048	13,880	6,310	115,051	16,686	179,890
Other gasoline	1,262	25,161	88,957	434,284	610,119	586,157
Kerosene	65	0	719	784	0	0
Gas oil, etc.	547,576	621,444	319,529	413,894	278,381	724,171
Residual fuel oil	206,751	273,863	374,837	103,124	114,137	129,620
Lube oils	14,910	25,986	82,118	20,038	144,586	197,043
Japan totals	775,612	960,334	872,470	1,087,175	1,163,909	1,816,881
All countries	7,107,372	4,965,210	4,983,077	4,119,834	4,353,677	4,709,505
Japan per cent	11	19	18	26	27	39
Crude oil—						
Japan totals	960,270	1,193,337	887,239	1,128,339	1,159,253	1,083,382
All countries	5,692,345	5,607,267	4,169,614	4,260,484	5,268,758	3,805,086
Japan per cent	17	21	21	26	22	28

Anse La Butte Salt Dome Shows Brisk Development



A dozen active operations, representing seven different companies and operators, are now listed in this field, which is beginning to take its place among the leading and most active fields on the Louisiana Gulf Coast.

By NEIL WILLIAMS

NEW ORLEANS, La., Jan. 21.—After years of disappointing exploration rewarded until recently only by the occasional completion of small, or short-lived, shallow-sand wells, the old Anse La Butte salt dome, St. Martin Parish, with the development of prolific flank sands, discovered the past year, is beginning to take its place among the leading fields on the Louisiana Gulf Coast.

Not only is the field now the most active in drilling on the Louisiana coast, but daily production, despite constant curtailment of individual well outputs under stringent proration restrictions, is being boosted to higher peaks each month. With known sands and areas far from proved up and additional sectors and sand potentialities remaining to be exploited, no early abatement in activity is indicated.

Latest drilling reports list a dozen active operations in the field, the highest number since the new development started. In these, seven different companies and operators are represented, with others either temporarily inactive or due to enter the play shortly to swell the number of working rigs. Numerous small tracts within the play and highly diversified lease ownerships are forcing intensive development.

Since August, the daily allowable production has increased from less than 1,000 bbl. to above 2,521 bbl., the allowable set under the January 1 proration order of the Conservation Department. Less than a year ago, before the opening of the new flank sands, daily production of the field was under 80 bbl., the output of a few, small, marginal pumping wells drilled over a long period.

Picture at top shows recently completed well, a drilling well, and a test rigging up. That immediately above shows old shallow-sand pumping wells at Anse La Butte, in contrast to the new deeper-flank sand wells now being drilled

Proving up of important production at Anse La Butte is giving renewed substantiation to beliefs held by most operators that all coastal domes, regardless of the extent and results of previous drilling, always hold additional potentialities for new development. Although there are a number of unproductive domes, as well as quite a few other domes on which production has been limited, that, like Anse La Butte, have been known for many years, some since the preceding century, all still are looked to as sources of future new fields and reserves for the district.

At this time, exploration and development for new reserves on and around the known salt domes constitutes an important phase of field operations on the Louisiana coast. On virtually every one of these domes, of which there now are 55, drilling is being carried on. Despite the attention directed to the discovery and development of other types of fields, these domes still are holding their attraction, and within recent months there has been increasing interest centered in them.

The number of unproductive domes, of which only 10 remain, is being reduced steadily. Each year generally sees one or more of these domes added to the productive column. Most recent of these has been the old Section 28 (Hager) dome, St. Martin Parish, where a distillate well was completed by Superior Oil Co. the middle of December. That dome, located only about 12 miles from Anse La Butte, also is one of the "old timers."

Attempts to drill for oil or gas at Anse La Butte were recorded as early as 1899. These were inspired by the observation of considerable quantities of gas escaping from natural springs in the vicinity. Among early drillers was Capt. A. L. Lucas, who, in that year, started a test but quit to go to Beaumont, where, in 1901, he opened the gusher Spindletop field. Discovery of oil at Spindletop was the incentive for renewed drilling at Anse La Butte. Pioneers in this were Moresi Brothers, water-well drillers, of Jeanerette, La., who drilled two shallow tests late in 1901 and 1902. The Moresi family retains substantial holdings in the field. Shortly afterward, W. Scott Heywood, who had just brought in the Jennings (Evangeline) field, Acadia Parish, as the first field for coastal Louisiana, started a test, which completed for 150 bbl. of oil daily in a sand at 1,170 ft.

Subsequent Wells Small

Subsequent wells brought in over the next several years were all small, and it was not until November 1907, when Lake Oil Co. completed a well flowing an estimated 3,000 to 4,000 bbl. daily that any particular attention was directed to the field. This well started a spurt in activity, and over the next several months numerous shallow tests were drilled, but as many of these were failures or small wells, the play quickly subsided, and interest of operators shifted to other more flush fields being opened at that time. For several years after that the field was inactive.

It was not until after 1916 that particular interest in the potentialities of the dome were revived. From then, however, until 1930, numerous attempts were made by many companies and operators in succession to develop production. Although there was no large-scale drilling play, there was hardly a time during that period but what some exploration was under way. The greatest activity noted in that period took place from 1920 to 1922 when both Gulf Refining Co. and Humble Oil & Refining Co. became interested in the field, each

drilling quite a few tests before giving up. Except for a few wells that showed small quantities of oil, all this drilling was without success.

Most of the early development was confined to an area close around the borders of Flat Lake, a swampy sump or flat some 1,000 to 1,800 ft. in diameter, overlying the top part of the dome, where most productive sands were found at depths of from 900 to 2,000 ft. Although a few tests at outpost locations around the shallow-sand area were drilled to depths below those sands, several to depths below 4,000 ft., it was not until 1928, 1929, and 1930 that any particular effort was made to develop the deeper-flank sands.

In the latter years, Yount-Lee Oil Co., inspired by successes it had in developing deep-sand production off the flanks of Spindletop, Jennings, and several other old salt domes, entered the field and drilled a series of seven tests off the north side of the shallow-sand area. One of these found an oil sand at 3,700 ft., from which it produced for a short time, but with this exception, all proved failures. The two deepest tests were drilled to 6,200 ft., where they were quit in salt. Until now, the 3,700-ft. sand found by Yount-Lee Oil Co. has been the deepest production in the field.

No further development of importance then was undertaken in the field until late in 1936, when Stanolind Oil & Gas Co., which had acquired the properties of Yount-Lee Oil Co., started a deep test on the southeast side of the dome. This test, 1 Patin, by a peculiar twist of circumstances just missed discovery of the Patin sand, the most prolific so far of the new flank sands which have been opened this year. It first drilled a vertical hole which encountered salt at 4,599-4,643 ft. This hole was plugged back to 2,647 ft., where it was sidetracked, and a new hole was drilled away from the dome. This hole, quit at 6,147 ft. with stuck drill stem, found only salt-water sands. It since has been learned that the oil zone of the Patin sand lies between those two holes. The top of the sand pinches out on the dome just below where the first hole found the salt, while the oil-water contact was just above where the second hole went into the sand. The discovery well of the sand, drilled by Glassell & Glassell, was located on the dome about midway between the two Stanolind holes.

Shallow-Sand Tests

No further development was undertaken by Stanolind at that time, but after that test was quit, early in 1937, a number of other operators, chief of which was Crusader Petroleum, Inc., became interested in the field, and during the remainder of 1937 and 1938, about a dozen additional scattered tests were drilled. However, except for one, which went to 4,140 ft., all were shallow-sand tests. A number of wells were completed but these were small and most of them made considerable basic sediment and water.

At the beginning of the present flank-sand-development play there were only eight of these old shallow wells remaining with a total net oil production of less than 80 bbl. daily, all pumping. The deepest of these was 1,600 ft. Gravity of the oil runs about 21° A.P.I. Two additional shallow-sand wells have been completed along with the deep-sand development.

Production of the field prior to this year totaled slightly over 800,000 bbl. Of this, more than 185,000 bbl. was in 1908, the peak year, occasioned by the first active play in the field which came late in 1907 and the early part of 1908 following the completion of Lake Oil Co.'s 4,000-bbl. well, previously mentioned. Since then, production has dropped off to yearly outputs, in some years, of less than 2,000 bbl. The shallow-sand play in 1937 ran the production up again to a total of 52,000 bbl. in 1938, but this production again was short lived, and in 1939 only 15,000 bbl. was recovered. With the new development just getting started, the field produced 39,275 bbl. in the first 6 months of 1940, while in the last half of 1940, production totaled 300,000 bbl., making total production for 1940 nearly half as much as for the entire previous life of the field.

Since the recent flank-sand development began last February, a total of 21 producing wells, exclusive of 2 shallow-sand pumpers, as of January 1, 1941, have been completed. These represent six different sands, taking in various different sectors extending around the southwest, south-southeast, and east sides of the dome. A record of these wells by sands and companies follows:

	Breaux sand	Patin sand	First Moresi sand	Second Moresi sand	Bergeron sand	Patrick sand	Total sands
Crosby Drlg.	0	2	0	0	0	0	2
O. W. Dyer	0	0	0	0	0	1	1
Glassell & Glassell	4	4	0	0	0	0	8
Iberia Pet.	0	0	2	1	0	0	3
Rice Drlg.	0	1	0	0	0	0	1
Stanolind O. & G.	0	4	0	0	1	1	6
Total	4	11	2	1	1	2	21

The Breaux sand was the first opened in the new development play. This sand is found on the southwest side of the dome. Discovery well was Glassell & Glassell 1-A Breaux, the first test drilled by these operators. It first was drilled to a total depth of 5,517 ft. where it had salt from 5,340 ft. Casing was cemented at 5,500 ft., and perforated in the sand at 4,630-50 ft., where the well flowed at the rate of 339 bbl. daily through a ¼-in. choke on potential test. This company's second test, located about 750 ft. southeast, found the sand low at 5,010-47 ft. and got salt water. The third test, located about 100 ft. northeast of the discovery well, and closer into the dome, was completed in the sand at 4,552-57 ft., and made a good producer, being completed in May. The fourth and fifth tests found the sand still higher up on the dome and made good wells.

Open Moresi Sand

In the meantime, Iberia Petroleum Co. started development on the south side of the dome, where in March it opened the first Moresi sand, the discovery well, the company's second test being completed at 2,439-78 ft., flowing at the rate of 331 bbl. daily through a ¼-in. choke. This well also found a sand showing oil at 1,350-75 ft., known as the Rice sand, which it passed up in preference to the deeper horizon. Iberia Petroleum Co. since, in November, has completed a second well in the first Moresi sand which, located a little closer to the dome, was encountered at 2,360-75 ft.

The Patin sand, discovery of which in April closely followed that of the first Moresi sand, has proved the most prolific and been the most extensively developed. It is found on the southeast side of the dome at depths ranging from

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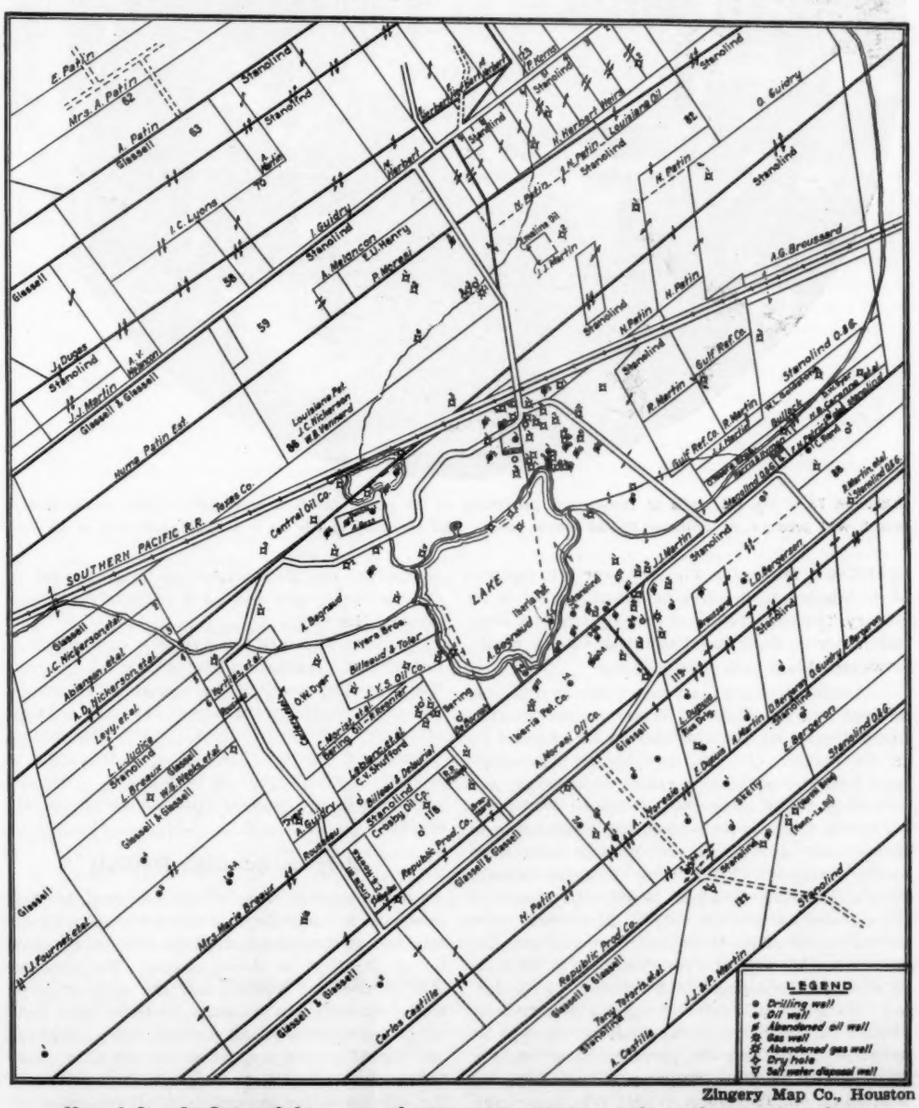

Zingery Map Co., Houston

Map of Anse La Butte salt-dome area, showing recent extensions to the southwest and southeast

Improved Wildcatting Results Expected in Mississippi in 1941

By
GEORGE WEBER

Although 79 of the 105 wells at Tinsley are producing on the pump, the field represents a large crude reserve which will produce on artificial lift for many years. This servicing unit is on a well in north end of the field

JACKSON, Miss., Jan. 21.—The year 1940 brought to Mississippi the greatest search for oil in its history. The search was not entirely fruitless since one minor oil field was discovered. On the whole, however, it was very disappointing.

In many ways the past year's activity in Mississippi is a repetition of former booms in other areas. Incited by the discovery of commercial oil in the autumn of 1939, the play in Mississippi, long pending, broke and gained momentum and was at its height by the first of 1940.

Leasing followed little geological preparation in most cases, and blocks and wildcat tests were easily promoted. Wildcatting followed closely after the leasing campaign began, and a total of 95 wildcats, comprising 495,000 ft. of hole, were drilled in the state. While the record of one discovery for 95 wildcat operations leaves little to be said for the success of Mississippi's play during 1940, the state's future prospects must not be viewed on this basis. An analysis of the type of wildcats drilled, and the preparation in locating them greatly modifies the prospective outlook for Mississippi oil. Therefore, as 1941 gets under way Mississippi operators expect an improvement in the discovery rate and have definitely not condemned the state.

The poor record of the past year can be laid to insufficient preparation and geological information regarding many of the operations. In numerous cases blocks were assembled and wildcats promoted with little effort toward determining chances for success. The value of this type of wildcat is well known to be nil, and it contributed largely to the ineffectual campaign in Mississippi.

Rely on Scientific Methods

Serious efforts were made, however, to drill prospects in the state on a scientific basis. Operators and oil companies drew heavily on geophysics in an effort to obtain control. But shooting was carried out hastily, and the data obtained were not sufficient in many cases to map accurately the areas shot. As a result, many geophysical "highs" proved normal or low. Another, more telling, factor in the poor geophysical record of the year, was the general lack of geological information on the state. Although Mississippi had been drilled to some extent, the subsurface data at hand were not sufficient for geophysicists for evolving a method of interpreting their shooting data.

This by no means indicates that geophysical exploration will not show results in Mississippi. It does indicate, however, that until an improvement is made in the interpretation of geophysical data, other means of control must be found to correlate with geophysics. The recent trend in Mississippi exploration is marked by both the improvement in geophysical work and expansion of exploration to include other methods.

The most basic and perhaps the most important need in Mississippi today is for more surface geology. This is being met by many companies and individuals who are going into the field. Core drilling has begun to augment this work, and some core tests have been drilled to a depth sufficient to provide subsurface information of importance. About a dozen core tests have been drilled in Scott, Covington, Jefferson Davis, Montgomery, and Madison counties and more are projected for Tallahatchie and other counties shortly. Some oil-analysis work is being carried out, but it is limited in its extent.

The wildcats drilled since the current Mississippi play began have served an important purpose in giving geologists the first extensive knowledge of the subsurface, particularly in the central part of the state. This cumulative factor will tend to improve the percentage of success in future wildcat tests.

Holding Acreage

During the end of 1940 the first rentals came due on much acreage leased in late 1939. It is interesting to note that rentals are being paid in a high percentage of cases. The only acreage being turned back in any quantity is located around abandoned wildcats, and in many cases blocks around such tests are being held intact. This bears out the general belief that many wildcats were either poorly located or were not drilled to a sufficient depth to constitute a conclusive test.

While leasing took place throughout the state during 1940, the most intensive activity was in central and west central Mississippi. Three Cretaceous formations, the Selma chalk, Eutaw and Tuscaloosa, producing at Tinsley and Pickens, were the principal objects of the wildcat in that area. Many tests were drilled to contract depths and abandoned without regard for the need to penetrate all of those formations. The concentration of drilling in the central basin resulted partly from lower drilling costs in exploring the relatively shallow prospects. Development of two other regions of the state may be expected to materialize in 1941.

The coastal sector, which may produce from the Sparta-Wilcox, entails deeper drilling and is restricted generally to larger operators. Major oil companies have continued to lease large tracts in that region from lumber companies and other large landowners, and exploration will be carried out gradually and thoroughly, without the haste

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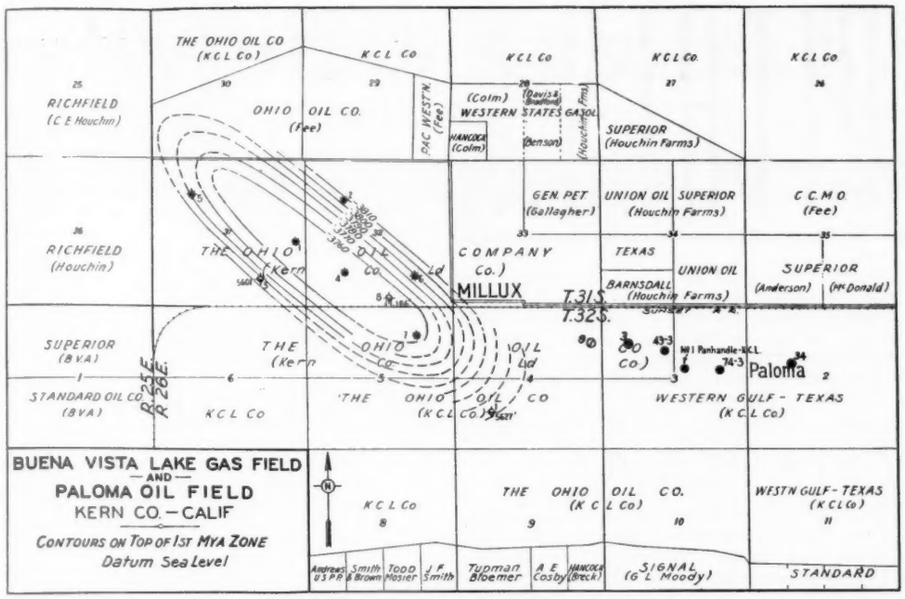

California operators face a new experience with the discovery that the Paloma field in Kern County is a distillate producer. Development of the field has taken place along a line downstructure in the hope of finding oil below the gas cap

Paloma California's First Distillate Field

By L. P. STOCKMAN

LOS ANGELES, Calif., Jan. 21.—After trying for several months to find a normal black crude oil around the edge of the Paloma field in Kern County, California, Western Gulf Oil Co., Ohio Oil Co. and others interested in the development of this district have come to the conclusion that the hydrocarbons present in the structure are entirely in vapor phase in the formation and they have therefore a typical distillate structure quite similar to areas found in the South Texas and Gulf Coast districts. This situation, which has been suspected for a long time, was formally recognized about a month ago and representatives of Western Gulf, Ohio Oil Co., Union Oil Co., Barnsdall Oil Co., Texas Co., Superior Oil Co., General Petroleum Corp., Standard Oil Co., Kern County Land Co. and other operators holding potentially productive acreage on the structure have held a series of meetings to formulate plans whereby maximum efficiency will be achieved. The problem confronting operators in the Paloma field is a serious one due to the multiplicity of ownerships involved and the operating problems present. No definite program has yet been formulated although several operators are of the opinion that the entire structure should be unitized in one form or another.

The Paloma field has only produced about 150,000 bbl. of refining crude oil up to the present and because of the limited amount produced is still susceptible of unification. The crude charged against this field is really not a normal crude oil but is rather a condensate with the gravity averaging around 52° A.P.I. Western Gulf Oil Co., discoverer of the Paloma field, has completed three wells, and Ohio Oil Co. has finished two wells. Each company is drilling one additional well at the present time. Because of the cost involved and the necessity of maintaining equal injection pressures along with the necessity of drilling wells at the most advantageous positions on the structure for efficient operation it would appear that unification of operations would prove beneficial to all concerned. It is not necessary that operations be unified but it would undoubtedly prove less costly. The California Natural Gasoline Association has given special attention to the phenomena of retrograde condensation and distillate-type structures during the past 2 years and hence a number of operators are familiar with the problems involved.

The committee studying the situation at Paloma has been attempting to outline the possible outer limits of production preliminary to determining just how many input and producing wells must be drilled if the field is to be developed individually instead of collectively. Due to the location of small properties along the north flank of the field there is a probability that operators and landowners might get together and pool their acreage and thus avert competitive development. Much of this acreage fronts on leases of Kern County Land held by Western Gulf Oil Co. and if these small holdings could be pooled it would simplify matters and permit Western Gulf and the operator of pooled acreage to work out an equitable method of operation.

Three Operators Hold Leases

Reference to a map of the Paloma field will reveal three operators holding leases on possibly productive acreage in Section 34-31-26 and that the smallest parcel in this section is the 80-acre Houchin farm parcel held by Barnsdall Oil Co. The Houchin lease held by Barnsdall Oil Co. adjoins Kern County Land property held by Ohio Oil Co. under lease, and the 160-acre Houchin lease held by Union Oil Co. adjoins Kern County Land property held under lease by Western Gulf Oil Co. All operations of Western Gulf Oil Co. in the Paloma field are a joint operation with the Texas Co. and each of these operators holds a 50 per cent undivided interest in drilling and development costs as well as a similar interest in all production. The extent and productive limits of the Paloma field remain undetermined at present although all indications point to the probability that the productive acreage will cover a large area. A well of Western Gulf Oil Co. in Section 12-32-26 hit the pay late this week at 10,275 ft. and a successful completion would prove up additional acreage for production. If this well, 12-12-B Kern County Land of Western Gulf Oil Co., shows large production, it will mean that a minimum of 1,200 acres will be found productive in the Paloma field. The ultimate amount of productive acreage may greatly exceed this amount.

New Development for Operators

Operation of the Paloma field as a distillate field will be a new development for California operators as no other field has been found in the state where the hydrocarbons are in the vapor phase in the formation. It will also present some operating problems for marketing companies and pipe-line operators. Distillate production is the equivalent of approximately 3 bbl. of crude oil as far as gasoline production and the recovery of other light fractions are concerned and for this reason the Paloma distillate field may exert a very pronounced effect on the future supply of light oil. It is a little early to venture an opinion as to the possible ultimate recovery of distillate from the Paloma field, but a recovery of 50,000,000 bbl. of distillate would be the equivalent of about 150,000,000 bbl. of light refining crude oil. Due to a misconception of structural conditions, the Kettleman North Dome field has many times been regarded as a distillate field because some wells produced a straw-colored oil averaging around 50° in gravity. This 50-gravity condensate came from a gas-cap area on top of the structure and is similar to conditions existing in certain other California fields. The gas cap at Kettleman Hills did not remain in place but as might be expected subsequently expanded due to substantial withdrawals around the edge of the structure principally in the Huffman or west end of the field.

Transportation of distillate production from the Paloma field may present some new problems. It will require a movement of about 500 miles from point of origin to main refining centers and will necessitate the use of pipe-line facilities and tankers. What effect it will have on the transportation of natural gasoline by pipe line from San Joaquin Valley fields to refining centers in the Los Angeles and San Francisco areas remains to be determined. It is not likely that this distillate can be mixed with crude oil for transportation and it is also unlikely that it can be moved through crude-oil lines in batches unless some changes are made in existing pipe-line facilities. Under present conditions, due to substantial stocks of gasoline and a prolific supply of light refining crude oil which will yield a normal supply of fuel oil, marketers are not at all desirous of securing additional supplies of high-gravity condensate. This limited market reflects the decision of marketers to restrict purchases of condensate due to high losses involved in transportation. Richfield Oil Corp., due to high losses, has found it advisable to erect a crude-stabilizing unit to handle production in the Coles Levee and Tupman fields where the gravity is much lower and less volatile than distillate production at Paloma.

STATE CAPITALS...

TEXAS

THREE ANTICIPATED BILLS were introduced in the Texas Legislature last week. The first reenacts the present proration laws until September 1, 1943, without any changes in its form; the second would authorize the Railroad Commission to prorate wet gas and condensate as it sees proper; the third would create a separate appointive body to regulate oil and gas production in Texas. The first bill, introduced by Weaver Moore of Houston and Allen Shivers of Port Arthur, is expected not to encounter much difficulty in its passage, but the latter two measures are expected to meet with strong opposition before, if at all, being passed.

The proposed regulation for condensate production, introduced by T. C. Chaddick of Winnsboro, would supplant the present measure which allows condensate wells to be prorated to 25 per cent of their potential. The commission would have discretion in fixing the level to which condensate wells may be prorated.

The measure to create the Oil and Gas Commission of Texas, provides that its three members be appointed by the governor "with the advice and consent of the Senate," but no salary was set. The members are to serve 6-year terms, though the first three members will serve either 2, 4, or 6-year terms as decided by lot. The first chairman shall be the one drawing the shortest term. Each is to "thoroughly conversant either by training or experience with modern methods commonly used in exploring for, developing, and producing oil and gas."

Full authority to set up its own staff of experts, organization, and offices is accorded in the bill, with provision that the present supporting tax of ⅝ cent per barrel of oil produced be withdrawn from the Railroad Commission and allocated to the new body. All oil and gas employes are also transferred, with the right to dismiss those not wanted. All powers, duties, privileges, jurisdiction, and authority now exercised by the Railroad Commission are withdrawn and bestowed upon the new commission. These various acts are listed in the bill.

All orders, injunctions, and other writs in effect when the new law becomes operative are ordered continued to maintain the status. No violations, penalties, or forfeitures shall be disturbed by the change over to the new commission.

ANOTHER BILL OFFERED in the Senate Friday, by Grady Hazlewood, Amarillo, would permit the use of sweet gas in the manufacture of carbon black where the product was not less than 5 lb. of carbon black to each 1,000 cu. ft. of natural gas used.

Allan Shivers, Port Arthur, and Weaver Moore, Houston, offered their bill of 2 years ago extending the Texas shore 27 miles in the Gulf to give the state full control over all oil and gas that might be produced within that area. Gov. W. Lee O'Daniel vetoed the bill 2 years ago on the grounds that Texas already has sovereignty up to 27 miles offshore.

THE TEXAS RAILROAD COMMISSION on Saturday estimated that the state allowable for last week was 33,937 bbl. under the Bureau of Mines recommended figure when under-production of allowables were taken into consideration. With a total basic allowable of 1,787,707 bbl., the 10 shutdown days of January were figured to reduce the allowable to 1,211,026 bbl. Exemptions to shutdowns, placed at 98,365 bbl., brought the allowable up to 1,309,392 bbl., which was 2,115 bbl. over the week previous and 11,892 bbl. over the bureau's figure. Allowing for an under-production of 3.5 per cent, however, was expected to place the oil output at 33,937 bbl. under the bureau's figure of 1,297,500 bbl. The commission has announced that the present order would be extended through February, whereas the Bureau of Mines estimates that market demand for Texas crude will be 15,400 bbl. daily higher. Thus it appears that Texas' production will be kept well within bounds during next month.

OKLAHOMA

SPACING ORDERS FOR TWO POOLS were ordered by the Oklahoma Corporation Commission last week. For the West Seminole field of Seminole County, a 20-acre well spacing was ordered, while for the Lovell field of Logan County 40-acre spacing was adopted. The area covered by the West Seminole order includes E½ SE 25-9n-5e, SE and SW of Section 30, and NW, NE and NW 31-9n-6e.

The Lovell order applies to the Tonkawa, Hoower, Elgin, Simpson, dolomite, Lovell sand, middle Layton, and lower Layton zones, all of which have either been productive or have had oil and gas shows. This order covered leases in NW and SW of Section 2, all of Section 3 and SE and NE of 4-17n-4w, NW and SW of Section 15, all of Sections 16, 21, 22, 28, 29, 33, and 34, NW and SW of Section 26, and NW and SW of 34-18n-5w.

A STATE-WIDE PRORATION HEARING for determining the allowable crude-oil production during February, March, and April has been set by the Corporation Commission for 11 a.m. January 30. Purchasers and producers will meet at 10 o'clock to formulate recommendations to the commission. While the commission contemplates issuance of a 3-month order, length of the order will be determined in the producers-purchasers meeting. Oklahoma has held its allowable production at 390,000 bbl. daily for the past several months, consistently under the Bureau of Mines estimated market-demand figure.

OIL-STATE GOVERNOR . . .

SAM C. FORD, who was inaugurated governor of Montana on January 6, was born in November 1882 in Albany, Ky., where his father, William Ford, was in the lumber business. A few years later the family moved to Ivanhoe, Kans., and later to Garden City, Kans. Upon graduating from the University of Kansas in 1906, Governor Ford opened a law office in Helena, Mont., and 2 years later was made assistant United States attorney for Montana. In 1916 he was elected attorney general of Montana, and in 1928 was elected associate justice of the Montana Supreme Court, serving thereon until 1933. In 1910 he married Miss Mary Leslie Shobe, granddaughter of Preston H. Leslie, eighth governor of the Territory of Montana and twice governor of Kentucky. They have four children

MICHIGAN

REP. JOHN B. SMITH, Alma, Mich., has introduced in the state legislature a bill to eliminate the Michigan sales tax on motor fuels used in highway transportation. That used in farm vehicles already is exempt from the sales tax. Representative Smith claims the present method constitutes double taxation. He explained: "Gasoline costs about 11 cents. When they sell it at retail they add profit plus a 3-cent state gasoline tax and a 1½-cent federal tax. Then they charge 3 per cent sales tax on the whole thing. Motorists are taxed more than any other group and it is my purpose to relieve them." The state Board of Tax Administration estimates gasoline filling stations pay the state between $2,500,000 and $3,000,000 a year in sales taxes.

AMENDMENT TO THE MICHIGAN OIL-CONTROL LAW to put proration on a per-well basis instead of per-lease basis is expected next month. The state Oil Advisory Board plans the recommendation to P. J. Hoffmaster, supervisor of wells. A meeting to approve the change is set for February 10. It was favored by oil men at a public hearing January 13, with these added provisions: That operators will not be required to take "potentials" on new wells before proration orders are set; and authorization for the conservation department to enforce special precautions to prevent oil seepage from polluting fields and streams.

The per-well allowable plan was proposed to eliminate actual or potential inequalities of producing certain large wells on a lease to make up for deficiencies on small wells. Producing above the allowable, it was pointed out, defeats the purpose of the rule not to mention possible injustices to offset wells. The proposed plan would set each well up as a unit for proration purposes fixing the allowable as a ceiling for any individual well regardless of other wells on the lease to produce up to the allowed maximum.

A new regulation pertaining to the location and spacing of wells on tracts of less than 10 acres also is expected to be approved by P. J. Hoffmaster, supervisor of wells. Under the new proposed rule, an operator desiring to drill on less than 10 acres must submit a certified statement that he has made a bona fide effort to pool the small tracts into a single drilling unit, filing names of persons contacted, and other pertinent information, before a permit will be granted. If he refuses to pool then he must submit his reasons in detail. This proposed rule brought general approval from operators at the hearing.

KANSAS

THE STATE-WIDE MARKET-DEMAND HEARING for determining Kansas' allowable-oil production has been set by the Kansas Corporation Commission for January 27, in Wichita. The state at present is operating under a 194,000-bbl. allowable and in December the permissible figure was 192,400 bbl. Kansas' allowable production has shown a continued increase for the past several months as production in Illinois declined. In view of the fact that Illinois' production is continuing to show no tendency to increase, it is probable that purchasers' February nominations for Kansas oil will exceed those of January.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

Parallel Objectives

A year ago this column suggested the slogan of "Adequate Profits" for 1940's petroleum operations. While reports show that operators as a group fell short of this objective we see no reason for altering the suggestion as a guide to this year's operations.

Some might modify it, pointing out that the main concern should be to see that every phase of the country's defense program is fully supplied with petroleum.

Actually the two aims parallel each other. A continuance of this industry's strong preparedness position is entirely dependent on whether or not it is permitted to direct its operations so that it has the financial wherewithal to assure adequate petroleum supplies.

As to profits there have been indications since the first of the year that Washington might view any upward adjustments in petroleum prices with disfavor.

A report of the consumer member of the National Defense Advisory Committee regarding a small advance in furnace-oil quotations at eastern points is the latest case in point. The report indicates this particular member will assume that petroleum-product prices at the time she took office were adequate and any upward revisions will be interpreted as an effort to bilk the consumer.

The complicated market operations of the petroleum industry are no place for snap judgments. Market trends extending from an isolated field of the Rocky Mountains to a fuel-oil delivery on Fifth Avenue are interrelated. Domestic quotations, as poignantly emphasized over the past year, are directly influenced by conditions outside this country.

In the report no consideration was given to the production and servicing costs that enter into the sale of this particular product. Information that refinery and tank-wagon delivery quotations had been too low over a long period was ignored as were the petroleum indexes of the Department of Labor which reveal that petroleum prices are far below the average of other commodities.

The fact this industry generally over the past 3 years has not had the returns to which it was entitled was not studied as to causes. Indeed, there is no evidence that anything was covered in the investigation other than to substantiate the fact that prices were higher.

Just how dangerous this attitude on the part of a governmental body will be to this industry and to the defense program is quickly revealed in any sincere survey of market conditions prevailing at this time.

Average gasoline prices are the lowest since the depression period of the early thirties. At many refinery and consumer points they are the lowest since gasoline became an important product of the petroleum industry.

The industry now as in the past must look to gasoline for its principal revenue. The bulk of the plant investments are in facilities for the manufacture of that product and all divisions of operation are geared to the production of this essential commodity.

Gasoline prices will have to be advanced one or more cents per gallon before the normal price relationships are reestablished and the industry has a solid base on which to project its 1941 and later operations.

Any other program for this year will be unsatisfactory not only to the industry itself but eventually to all those enterprises which are dependent on petroleum in carrying on their normal and special operations.

The oil business over the next 12 months must go out and find, produce, process and distribute more than a billion and a half barrels of petroleum. It can't do this if it loses money on its most important products.

Not only self-interest but patriotic duty make it mandatory for operators to stiffen their backbones and do whatever is necessary to battle those who, because of misinformation or for other reasons, misrepresent petroleum's price conditions.

Improved Texas Conditions Reduce Proration Criticism

AUSTIN, Tex., Jan. 21.—Improvement in basic crude-oil conditions in Texas was indicated at the statewide proration hearing here January 16 and by subsequent developments. In making the record upon which hinge February and March proration orders there was relatively mild dissatisfaction voiced by producers and refiners over current conditions.

Purchasing companies nominated 1,605,875 bbl. daily in February and 1,615,951 bbl. in March. The February nominations are 130,043 bbl. under the daily commitments for December which prevail unchanged through January. More tangible evidence of improvement than the lack of serious complaint at the proration hearing came early this week when Republic Oil Refining Co., Houston, restored the crude-price cut in Southwest Texas.

Gulf Oil Corp. and Phillips Petroleum Co. presented the most vigorous claims for increased production in West Texas and the Panhandle districts, respectively.

P. O. Settle, of Fort Worth, Tex., attorney for Gulf, entered a request for 15,000 bbl. additional oil daily in West Texas. Gulf's stocks of 838,000 bbl. of West Texas crude are inadequate, Mr. Settle declared, and added that the 2,000,000 bbl. of all Texas stocks were below requirements of his company. E. H. Foster, of Bartlesville, Okla., attorney for the Phillips company, said his concern's crude stocks in the Panhandle would be depleted by February 10 unless allowables are increased. G. L. Knight, Phillips geologist in the Panhandle, testified that allowable could be raised to a range of 86,295 to 119,250 bbl. daily without waste. The present average allowable in the Panhandle is 59,882 bbl. daily.

Paul McDermott, of Fort Worth, attorney for Sinclair Prairie Oil Co., read a telegram from Harry F. Sinclair, chairman of Consolidated Oil Corp., urging the Railroad Commission to increase allowables at K.M.A., Bonita, and Walnut Bend, all in North Texas, and in the East White Point field, Nueces County.

The Texas Co. was the only large purchaser reporting long on Texas crude stocks. J. Sayles Leach, of Houston, representing the Texas Co., said his company had 8,148,494 bbl. of Texas crude in storage January 1 and that the total would rise to an estimated total of 8,624,991 bbl. on April 1.

Humble Oil & Refining Co. expressed satisfaction over its inventory position. The company had 13,423,000 bbl. on hand at the time of the hearing and Rex Baker, Houston, attorney for the company, said this total would be reduced to around 12,250,000 bbl. by April 1.

Pure Oil Co. asked for an increase of allowables to permit it to expand its storage position by 500,000 bbl.

Republic Oil Refining Co., which this week restored Southwest Texas postings, requested increases for Heyser, Plymouth, and East White Point pools. The request was based on increased demand for export movement to Europe.

Basin Pipe Line Co., which supplies Cosden Oil Co.'s refinery at Big Spring, Tex., asked higher allowables for wells to which it is connected in the Wasson field of Gaines County. C. L. McIver, president of the pipe line, asked for 5,000 bbl. daily, compared to 2,444 bbl.

Definite allowables for discovery wells in new Texas fields have been established for the first time by the Railroad Commission. Lack of a policy has caused certain confusion in the past, partly because it was possible for a new field to become a significant producing factor before it could be incorporated into the proration pattern. Furthermore, operators were in position to resist more than mild restriction on the claim that their investments were made on the basis of a more liberal policy. A production scale has been recommended by F. V. L. Patton, chief supervisor of the commission and by Chairman Thompson. The scale of allowables for new discoveries follows:

Depth—	Daily allowable
9,000 to 10,000 ft.	150
8,000 to 9,000 ft.	135
7,000 to 8,000 ft.	120
6,000 to 7,000 ft.	105
5,000 to 6,000 ft.	90
4,000 to 5,000 ft.	75
3,000 to 4,000 ft.	60
2,000 to 3,000 ft.	45
1,000 to 2,000 ft.	30
1,000 and below	15

Warner Fine Ends Jobber Case

CHICAGO, Jan. 21.—Imposition here last week of a $15,000 fine against John W. Warner, of Tulsa, district sales manager for Tide Water Associated Oil Co., by Judge Walter C. Lindley, closed the so-called second Madison oil case. The fine was assessed after Mr. Warner entered a plea of nolo contendere, the same channel through which other defendants in the suit chose to travel in concluding the litigation.

Before Mr. Warner entered a plea, Judge Lindley granted a government motion for dismissal of charges against the company and Edward L. Shea of New York, former executive vice president.

James C. Wilson, special assistant attorney general, reported in Chicago that the Government had collected more than $400,000 in fines and more than $25,000 in court costs in disposing of the cases.

In the other case, remaining to be tried, are actions against a number of defendants, mostly individuals, who were granted new trials at Madison on the original charge of conspiracy to raise and fix gasoline tank-car prices. Outside this category is the case remaining against the one corporate defendant in the first group, Standard Oil Co. (Indiana). The company has denied any connection with any gasoline-buying program, which was the keystone of the Government's charge of conspiracy. So far as is known, Standard is preparing for trial, which has been scheduled for April.

The Deep Rock Oil Co., which was dismissed in the price-fixing trial but remained as a nominal defendant in the other, also was eliminated from the picture Wednesday when Judge Lindley granted a motion to nolle prosse after holding the statute of limitations constituted a valid defense.

Of the 3 companies and 15 individuals to whom Judge Patrick T. Stone originally granted retrials in the price-fixing case, only the Standard Oil Co. of Indiana and the Cities Service Co. remain today as corporate defendants, while the eight individual defendants whose cases have not been settled are Edward J. Bullock, Chicago, Standard vice president; A. G. Maguire, Milwaukee, Wis., chairman of Wadhams Oil Co.; Harry D. Frueauff, vice president, Empire Oil & Refining Co.; H. E. Brandli, New York, vice president, Cities Service Export Oil Co.; O. J. Tuttle, Tulsa, tank-car sales manager, Empire Oil & Refining Co.; Harry J. Kennedy, Ponca City, Okla., vice president, and Edward Karstedt, Denver, Colo., former vice president of Continental Oil Co.; and Alexander Fraser, New York, president, Shell Petroleum Corp.

DEATHS

BYRON R. GRAHAM, 62, former general superintendent of the pipe-line department of the Mid-Continent Petroleum Corp., died January 18 at his home in Tulsa after a long illness. A native of Independence, Kans., Mr. Graham has spent his entire business life in the pipe-line division of the oil industry. He worked for the Forest Oil Co., and continued with it when it was renamed the Prairie Oil & Gas Co. When the Prairie Pipe Line Co. was formed, he worked with it in pushing extensions through the Indian Territory, and became manager of the Empire Pipe Line Co. when it was organized, and in 1918 he was named to head the Cosden Pipe Line Co., the transportation division of Cosden & Co., now Mid-Continent Petroleum Corp. He retired in 1936. He is survived by a son and two daughters.

WILLIAM T. WALLACE, 68, for many years in charge of the foreign operations of the Gulf Oil Corp., died at his Great Neck, N. Y., home, January 20, after a long illness. He was widely known in oil circles outside the United States, particularly in Mexico and South America. He directed the operations of the Gulf company in Venezuela and was in charge at the time its operating unit—Mene Grande Oil Co.—discovered oil in the eastern part of that country, now a major operation.

CHARLES CHEERS WAKEFIELD, 81, governing director of C. C. Wakefield & Co., Ltd., London, England, lubricating-oils manufacturer, died January 15. Lord Wakefield of Hythe died at Beaconsfield, England, entered the oil business upon completing his education at Liverpool Institute. He was knighted in 1907, was made a baronet in 1917, a baron in 1930 and viscount in 1934. He chose the title of Lord Wakefield of Hythe when he was made a baron. He made a large fortune in the oil business, and spent his money freely on hospitals, in encouraging the development of speed on land, air and water. His wife survives.

ELMER H. RITCHEY, 78, retired oil-well contractor, died last week at his home near Emlenton, Pa., following a lengthy illness. Mr. Ritchey followed the oil business during most of his life, and was well known as a contractor and producer. Four daughters and a son survive.

THE MARKETS*

CRUDE OIL: Return of Republic Oil Refining Co. to normal postings for crude oil in 10 Southwest Texas fields early this week gives evidence that conditions in Texas are undergoing gradual improvement. Republic rescinded its crude reductions of December 5 which ranged from 1 to 20 cents per barrel. The restored "normal" price became effective at Republic connections January 20. Improvement of Gulf Coast prices for some refined products was cited by D. W. Hovey, president of Republic, as justification for restoration of the price.

Sohio Corp. and other leading purchasers in southwestern Michigan increased prices 5 cents per barrel January 16 in Kent, Ottawa, Allegan, and Van Buren fields, elevating the price there to $1.23. Central and northeastern Michigan fields were increased 10 cents January 2.

REFINERY: A reduction of 0.2 cent per gallon in the East Coast price for No. 2 fuel oil and a cut of ⅛ cent per gallon in the Group 3 tank-car price for all grades of motor fuel were reflections of two disassociated influences. The East Coast distillate-fuel market settled back under the pressure of high stocks, slack consumption, and reduced tanker rates from the Gulf to North Atlantic ports. Competition with recycle-plant condensate accounted for depression of the Mid-Continent refinery-gasoline price.

TANK-WAGON AND POSTED-DEALER: Scattered motor-fuel price advances were reported in the Central States and New England. The advances were at points previously subnormal and consequently had no significance of a general nature. Distillate fuel-oil prices were down 0.2 to 0.3 cent per gallon in the New York and New England territory in sympathy with reduced tanker rates and terminal quotations.

FINANCIAL: The fractional gains of oil securities over the past month were nullified at the close of last week. Average of 30 representative stocks for the week ended January 18: High, 24.27; low, 23.49; close, 23.45. Week ended January 11: High, 24.41; low, 23.49; close, 24.02.

*Detailed information in Market Section.

I.C.C. May Order Gasoline Lines To Put Limit on Earnings

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 21.—Hints that the Interstate Commerce Commission may order gasoline pipe lines to reduce their rates on an earnings basis, similar to the reduction recently ordered in crude pipe-line rates, were dropped during the oral argument January 17 on Petroleum Rail Shippers Association case, Docket 28,106, in which Examiner Stiles recommended the institution of train-load rates on gasoline from Mid-Continent refining points to eight terminal points to the North and East.

While most of the day-long argument was directed to the train-load rate proposal — which would set an important precedent in petroleum shipping—several commissioners asked questions about gasoline pipe lines which suggested that they may be contemplating action to reduce minimum tenders and transportation charges by gasoline pipe lines.

Terminal points involved in the proceeding are Kansas City, St. Louis, Chicago, Des Moines, Omaha, Jefferson City, Iowa City, and Minneapolis. The examiner has recommended reduced rates on shipments of a minimum of 5,000 bbl., or 25 carloads. Shippers supported this before the commission but continued to press their preference for reduced single-car rates on gasoline, while railroads opposed the train-load proposal as an unjustified innovation.

During the proceedings Commissioner Eastman seemed especially anxious to inject questions on the opinion of industry counsel regarding gasoline pipe-line rates and also regarding the commission's recent order to crude pipe lines to reduce their rates to a point where earnings will not exceed 8 per cent on valuation. At one point he asked counsel for independent refiners whether gasoline lines should receive a higher return than crude lines, and the reply was that there is no justification for this because gasoline lines are no more hazardous than crude lines. Again he asked counsel for two gasoline lines whether the lines would reduce their rates or whether the I.C.C. should order reductions, and was answered that a reduction would make no difference because independent refiners would not use the pipe lines in any event.

Would Continue to Use Railroads

Counsel for independent refiners also stated that they would continue to use the railroads even though the rates were somewhat higher than pipe lines, because the pipe lines are controlled by the major oil companies, saying that pipe-line reductions would be significant only if they accurately reflected cost of operation and a fair return on the investment.

T. H. Burgess, counsel for the Great Lakes and Phillips pipe lines, said that independents could not use these lines, regardless of the rates, because of their geographical location. He criticized the I.C.C. crude-line order, particularly because it was based on 1935 traffic and earnings, saying that volume has been decreasing steadily since then. He also said that a minimum tender of 10,000 bbl., ordered for crude lines, would not be satisfactory for gasoline lines since his companies secure best results with shipments of 25,000 bbl. or more.

H. A. Hollopeter, of the Independent Petroleum Marketers Association of Indiana, asserted that independents would continue to use the railroads even with lower pipe-line rates and a lower minimum tender. Asked by Commissioner Eastman why they could not use lines operated on a cost-plus basis, he answered they would be used only if they were really common carriers and divorced from ownership or control by the majors, which, he added, "is not the case, and probably never will be." Mr. Eastman then inquired if exorbitant pipe-line profits were reduced, would it still harm the independents to have the lines owned by the majors. Mr. Hollopeter reported that it would, because the owners would still have first call on them.

His stand was corroborated by J. F. Lawrence, speaking for many independent refineries in the Mid-Continent area. Pipe lines could not "now or later" be substituted for railroads, he said. Asked by Mr. Eastman if his clients would still use the rails if pipe lines were cheaper, he said they would pay a premium for rail use as "a patriotic duty and for national defense." They would not change even if rail rates, or truck rates, were as much as 5 cents per 100 lb. higher, he stated.

Minimum Tender

Discussing the minimum tender, Mr. Burgess, counsel for the pipe-line companies, advanced the opinion that it could not be lower than 25,000 bbl. With a minimum of 10,000 bbl., as the I.C.C. is asking, he said there would be a 2 per cent contamination of the petroleum, while with a minimum of 5,000, as independents want, there would be a 4 per cent contamination.

He pointed out that with a 10,000-bbl. minimum, his companies would have to store it until they could accumulate 25,000 bbl. of the same grade before they would be able to ship it. At present they handle six different grades, he said. When Commissioner Splawn suggested that shippers pay for purifying the contaminated oil, Mr. Burgess avered that his companies were not willing to go into the refining business. Under questioning, he admitted there is a present contamination of 0.8 per cent, which he assured does not disturb the specifications. Asked whether lower rates would not increase volume of transportation, he replied, that volume was wanted only with "reasonable" rates.

Most of the 1-day hearing was taken up with discussions of the trainload rates recommended by Examiner Stiles on gasoline shipments of 25 tank-car loads to eight midwest terminal points, independent refiners and marketers repeated that they desired lower carload rates, but if that were not possible, they wanted trainload rates. Railroads and pipe-line companies reiterated that present carload rates should be maintained, and trainload rates be rejected.

Mr. Lawrence, for the independent refiners, asked that carload rates be reduced 15 cents per 100 lb. and trainload rates 20 cents per 100 lb., the difference being the cost at terminals avoided by through shipments to destinations. He insisted that reduced rail rates would increase rail revenue $200,000,000 annually.

Stressing that higher rail rates encourage shippers to use competing agencies of transportation, P. G. Anderson, Lion Oil Refining Co., El Dorado, Ark., declared that trainload rates, or preferably reduced carload rates, "would permit free movement of traffic by rail."

D. M. Orme, Cosden Petroleum Co., Big Spring, Tex., claimed it was discriminatory to keep from oil refiners the advantages enjoyed by shippers of blackstrap molasses from New Orleans to Peoria, and coal from Arkansas to St. Louis, both on trainload rates.

His charges were answered by M. G. Roberts, for the 82 defendant railroads. He said these cases are not precedents for the trainload case. The molasses moves between two points only, whereas petroleum is shipped from scores of origins to hundreds of destinations. In the molasses case, the I.C.C. ordered what the railroads desired, whereas in this case, the commission would order the railroads against their will. As for coal, he pointed out, St. Louis has an ordinance requiring a certain type of coal, and rail carriers therefore agreed to a trainload rate. Mr. Lawrence later asked why, therefor, did the rails charge 3½ times as much for fuel oil from the same area as for coal, where both answer to the St. Louis requirements.

Mr. Roberts criticized complainants for not filing exceptions to the examiner's statement that present carload rates are not unlawful. The reason, responded Mr. Lawrence, was that some carriers orally promised refiners to reduce carload rates before they changed their minds and decided to fight the decrease.

Mr. Roberts testified that proposed recommendations would require a 34 per cent reduction in rail rates, whereas studies showed that rails could not hope to gain the 51 per cent increased tonnage to get the revenue they have now.

Another witness was J. R. Lewallen, of the Tide Water Associated Oil Co., who asked that trainload rates be prescribed also to marine terminals.

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Issue Licenses Permitting Shipment Of Aviation Fuel to Canada

General licenses have been issued by the State Department permitting shipment to Canada of aviation gasoline and lubricating oil and materials and equipment for making them without individual export licenses for each shipment. The only product in this field still subject to separate license when exported to Canada are plans, specifications, and technical information for building plants to make aviation gasoline and lubricating oil.

N. P. A. Group Discuss Variety Of Topics at Annual Meeting

FRANKLIN, Pa., Jan. 17.—A well-rounded program touching on many matters of current interest to refinery laboratory men was presented at the semi-annual meeting of the Department of Standards and Tests of the National Petroleum Association here today.

It ranged from a closeup of bearing failures and oxidation of lubricating oils, through testing of boiler waters and general laboratory practices, with most of the subjects well illustrated with slides and motion pictures.

The elimination or reduction of bearing failures encountered in the main and connecting-rod bearings of automotive and diesel engines is a joint problem for the engine manufacturer, the bearing maker and the oil industry, John K. Anthony, of the Cleveland Graphite Bronze Co., Cleveland, Ohio, told the gathering after pointing out clues which revealed the cause of many cases of bearing trouble.

Any metallic bearing, the speaker said, if run under completely ideal conditions and if run long enough, will eventually fail due to fatigue, providing the load exceeds the endurance limit of that particular metal or alloy. The evidence of this death due to old age is the presence of numerous fine cracks in the bearing metal, which invariably start at the bearing surface and then work inwardly toward the bonding line. The third phase, termed quite astounding and probably the cause of most bearing failures, is the turning of the crack at right angles when it is within a short distance of the bonding line.

Turning to corrosion, the speaker said that subject had become quite alarming in the latter part of 1939 and 1940, particularly the copper-lead type, wherein the oil is oxidized and fatty acids are formed, which tend to dissolve the lead preferentially.

Oil corrosion can generally be recognized, he said, by the general appearance of the bearing surface and also by a reduction in the wall thickness of the bearing.

A description of the procedure and apparatus developed at the petroleum-refining laboratory at Penn State College for a continuing study of the mechanics of oxidation of lubricating oil was given by Dr. C. E. Stevenson, of the laboratory.

The speaker showed how a barrel of motor oil was broken up by narrow fractionation and solvent extraction into about 125 groups. These, of course, he said, were not pure compounds but homogeneous in character and may be said to represent closely related families of compounds of similar properties and characteristics.

The studies were also carried on to determine the effect of the various catalytic metals present in an operating engine such as lead, iron and copper.

The speaker described further studies of application of numerous additive agents, some of which suppressed corrosion, some sludge and varnish and some appeared to improve resistance of the oil to both phenomena. He indicated that it was not only necessary for an additive compound to counteract the natural disposition of oils to oxidize in the presence of excessive heat, moisture, etc., but also to deactivate catalytic effect of the metals.

General laboratory procedures were discussed by W. C. Winning, of the Esso Laboratories, Standard Oil Development Co., of Elizabeth, N. J. His talk led to a discussion of general practices.

H. R. Powers, of the National Aluminate Corp., Pittsburgh, Pa., spoke on the testing of boiler water and showed the growth of various types of scales on slides. The reaction of various chemicals was also illustrated. Later some tests of water, brought in by members of the N.P.A., were run through.

A movie, "Slow-Motion Study of Normal Combustion Preignition and Knock in a Spark-Ignition Engine," provided by the National Advisory Committee on aeronautics, was shown.

J. E. Keller, executive secretary of the N.P.A., presided. T. G. Murphy, of the Franklin Creek Refining Co., chairman of the Oil City-Titusville group, welcomed the members.

●

Journal Will Sponsor Special Train to A.P.I. Meeting

The Oil and Gas Journal has completed arrangements for a special train from Tulsa to the annual meeting of the American Petroleum Institute in San Francisco, Calif., November 3-7. It will be known as "The Oil and Gas Journal Special."

The train will leave Tulsa on Friday afternoon, October 31, and will arrive in San Francisco on Sunday morning, November 2, at 9 a.m. Another section of the train will come out of Chicago, meeting the Tulsa train at Newton, Kans. The latest and finest in streamlined equipment will be used.

The Journal sponsored a similar train on the Santa Fe in 1935, when the A.P.I. meeting was held in Los Angeles, and also in 1926, the first year the A.P.I. went to the Pacific Coast. A detailed announcement concerning the train, schedules, and method of operation will be made later.

Speakers and officers at the meeting. They are: Seated—Dr. C. E. Stevenson, Penn State College; J. E. Keller, Washington, D. C., executive secretary; H. R. Powers, National Aluminate Corp., Pittsburgh, Pa. Standing—W. C. Winning, Esso Laboratories, Elizabeth, N. J.; John K. Anthony, Cleveland Graphite Bronze Co., Cleveland, Ohio; T. G. Murphy, Franklin Creek Refining Co., Franklin, Pa., chairman of the Oil City-Titusville group

Improved Wildcatting Results Expected in Mississippi in 1941

(Continued from Page 16)

and poor preparation which characterized the play to the north last year.

The Paleozoic sector of Mississippi, including that northeast part of the state lying in the Northwest Alabama or Warrior basin, is also expected to gain in wildcatting during 1941. Drilling there is harder and more costly than in the Cretaceous area to the south and west, but leasing and blocking indicate that subsequent wildcatting should continue for a considerable period. Prospects for finding oil production in three formations which outcrop to the northeast are considered good, if suitable control can be developed in shooting the area. The Hartselle and Bethel sands, and the Gasper lime are asphalt bearing at their outcrops, and it is reasonable to expect that if local folding or uplift of these strata to provide sufficient closure exist downdip, the formations should produce oil.

Tinsley Development Rapid

Although wildcatting in Mississippi currently looks disappointing, the reverse is true of the state's first oil field. A total of 109 wells were completed in the Tinsley field to the end of 1940, and curtailed production averages 13,837 bbl. daily.

Sands in all three of the Cretaceous formations, the Selma, Eutaw and Tuscaloosa, produce oil at Tinsley. The principal sand, and the one most extensively drilled is the Woodruff sand, which ranges in thickness from 0 to over 100 ft. The sand thickens down structure, so that field extensions during 1940 have added materially to the field's estimated reserve.

The Stevens, Perry, Lammons and Powell sands have been explored to a limited extent on structure, and it is believed that they will produce in many wells completed in, and drilled only to the Woodruff. This is true particularly of the Perry sand, which shows an effective thickness where drilled of 20-25 ft. and may prove an important secondary horizon. Considering an average effective thickness of 20 ft. and a porosity averaging 28-30 per cent for the Woodruff sand, together with the extent of recoverable oil in the other sands as now defined, the field's total crude reserve is conservatively estimated at 37,000,000 bbl. It is productive over about 4,500 acres at this stage, and is defined only on the east.

Tinsley had produced right at 4,000,000 bbl. at the end of 1940. Because of the low original reservoir pressure, most wells are now completed on the pump, and 79 are now on the beam. This represents a form of curtailment, but lack of a ready market has had more effect in keeping Tinsley production down. Most of the output moves by tank car to Baton Rouge, where it is refined by Standard Oil Co. of Louisiana. The Vicksburg refinery of E. C. Johnston processes oil from his lease in the field.

Pickens, the 1940 discovery, proved to be limited in extent, as was expected when it was discovered. Unlike the Tinsley field, which is located on a major uplift, Pickens shows slight closure and extent of production in the Wilburn sand of the Eutaw formation. The field is defined in all directions, but the four wells are closely drilled and actual productive area is unknown. It has produced about 290,000 bbl. of oil. Crude is now being moved north by tank car to St. Elmo, Ill. Neither Pickens nor Tinsley have pipe-line outlets at this time, the latter representing one of the largest fields in the country wholly dependent on rail and highway outlets.

International

Colombia . .

Increased Oil Exports Shown In Report for Nine Months

A 25 PER CENT increase in Colombia's exports of crude petroleum occurred in the first 9 months of 1940. Shipments in the January-September period of last year aggregated 18,038,000 bbl. against 14,369,000 bbl. in the corresponding period of 1939. The bulk of the increase was recorded in shipments to Canada which gained more than 2,000,000 bbl. Exports to the Netherlands West Indies were up 750,000 bbl. and 563,000 bbl. were shipped to the Canary Islands and 315,000 bbl. to Portugal, which in the same period of 1939 did not receive any Colombian crude. Exports to the United States were reduced almost 1,000,000 bbl.

Exports from Covenas, terminus of the pipe line through which shipments from the Barco concession were inaugurated November 5, 1939, averaged 11,150 bbl. per day during the 9 months of 1940.

A comparison of Colombia's exports in the first 9 months of 1940 with those in the same period of 1939 follows:

Destination—	First 9 months 1940	First 9 months 1939
Canada	6,079,000	4,036,000
Netherlands West Indies	7,314,000	6,559,000
United States	186,000	1,168,000
Argentina	747,000	85,000
Czechoslovakia	0	53,000
France	2,276,000	1,897,000
Italy	459,000	500,000
Norway	99,000	0
Portugal	315,000	0
Canary Islands	563,000	0
Union of South Africa	0	71,000
Total	18,038,000	14,369,000

Of Colombia's total 1940 exports, 14,982,000 bbl. were shipped from the port of Mamonal and 3,056,000 bbl. from Covenas.

Paraguay-Uruguay . .

Exploration Fails to Reveal Oil Indications

THE petroleum possibilities of two South American countries, Uruguay and Paraguay, are discussed in the current issue of Foreign Minerals Quarterly, a publication of the U. S. Bureau of Mines. The current issue is devoted entirely to a study of the mineral resources, production and trade of these countries.

Geological investigations that have been carried out by the Institute of Geology in various parts of Uruguay have failed to reveal any substantial indications of petroleum, the publication states. The only hole that has traversed the whole thickness of the Gondwana beds is that at Yaquari, in Rivera, and this failed to find oil.

According to J. D. Falconer, in Bulletin 23 of the Institute of Geology, it is possible that further information might be obtained by systematic geophysical prospecting. A controlled attempt to settle the question of oil in Uruguay by drilling on selected sites would be of permanent benefit, the bulletin relates, if not in the location of oil then in the advancement of the knowledge of geology.

The refining and sale of petroleum products in Uruguay is a government monopoly under the direction of the ANCAP. In January 1937 a refinery was completed at La Teja, near Montevideo, which has a daily capacity of 5,000 bbl. of crude.

Regarding Paraguay, the publication states that there is no specific information as to the presence of oil-bearing formations or their depth in the Chaco of Paraguay or to the south in Argentina and no exploratory drilling has been done. Present belief that oil occurs is based upon long-range extensions from oil fields in other South American countries.

Certain geological explorations have been made: (1) on the plateau of Ballivan along a possible north-south anticline, but the absence of outcrops in this section makes surface studies almost useless; (2) on the low chain of hills of Ingavi and Ravelo in northern Chaco where sandstone and shale beds outcrop; and (3) in the valleys of Manduvira and Salado east of the Paraguay River near Asuncion where the possibility of petroleum is based on geological characteristics found in other oil-bearing areas.

In eastern Paraguay the Paleozoic formations in which the oil may occur are prominent in the valley of Piribebuy, according to Prof. G. T. Bertoni, in a recent publication (Geografia Economica Nacional del Paraguay, Editorial Guarani, Asuncion). This report also mentions the fact that the same sediments found at Villa Hayes were encountered at the oil fields of Salta in Argentina at a depth of 5,000 ft.

With so little evidence of oil in Paraguay it would be difficult to induce any of the large oil companies to undertake exploration regardless of conditions that may be offered. If, however, the government were to employ an oil geologist to carry out field work for a year or more and thus obtain more tangible data, this might give indications sufficiently encouraging to warrant geophysical studies to be followed up by drilling. If oil could be found there would be little difficulty in interesting outside capital willing to extend explorations under reasonable arrangements.

Great Britain . .

Diversion of Belgian Tankers To British Service Is Upheld

THE British Government is displaying determination to maintain control over marine equipment registered under flags of European governments which are no longer in position to protect their integrity. This policy came to light a week ago in a suit brought by Gulf Oil Corp. attempting to remove four oil tankers from jurisdiction of the Belgian Government.

At Sherman, Tex., federal Judge Randolph Bryant overruled protest of Gulf Oil Corp. of Pennsylvania to the transfer of the four Belgian tankers to Great Britain.

Belgium requisitioned the vessels from the Gulf Oil Corp. of Belgium last May 17, permitting them to continue operation under a license expiring November 20, 1940. The company was notified November 1 that the boats would be released to Great Britain. The Gulf of Belgium served notice that it intended to sell the vessels to the Gulf of Pennsylvania for transfer to Panama registry.

Allen Dulles, of New York, attorney for the Belgian Government, valued the ships at $4,000,000, and said they were needed for prosecution of the war. The tankers are the Good Gulf, Lubrafol, Belgian Gulf, and Spidoleine, now at Port Arthur, Tex.

Rumania . .

French Engineers Constructing Rumanian Oil Line for Nazis

GERMANS have sent French oil engineers to Rumania to help in building a pipe line between Ploesti in the oil fields and Giurgui on the Danube, according to a correspondent of the Free French Agency. A British broadcast, picked up in New York, reported the plan.

Mexico . .

Operating Deficit Remains Paramount Pemex Problem

SUCCESS of Mexico in reopening the United States market for its petroleum has not solved the paramount economic problem which has accumulated since expropriation of private-company properties in 1938. Means for liquidating a deficit of 68,000,000 pesos have not been adopted so far in a tangible, concrete program. A policy of economy in operations was inherited by the administration which took office December 1, 1940, but opposition of labor leaders has so far successfully blocked efforts to reduce personnel.

Vicente Lombardo Toledano and leaders of the Petroleum Workers' Syndicate have scheduled conferences with Efrain Buenrostro, the new managing director of Petroleos Mexicanos. Representatives of the syndicate broke off negotiations for retrenchment of operating expenses 6 weeks ago when the government proposed discharge of 4,000 to 6,000 workers.

According to unofficial reports, Mexico's exports of oil in October totaled 1,707,000 bbl. against 1,828,000 bbl. in September, a decline of 121,000 bbl. October's exports were reported to have consisted of 1,120,000 bbl. of light crude oil, 143,000 bbl. of heavy crude, 135,000 bbl. of gasoline and 309,000 bbl. of light fuel oil.

For the 10 months ended with October, the unofficial total of Mexican petroleum exports was 16,796,000 bbl.

Hungary . .

CONSTRUCTION of a pipe line from the Lispe field in the southeastern part of Hungary terminating in Budapest is reported from Europe through the current issue of International Petroleum Trade. The line has a rated capacity of 3,700 bbl. daily and the system connects with a new well at Lovaczy, 11 miles north of Lispe, where Hungarian-American Oil Co. has developed a well with initial production of 185 bbl. daily. The company's Lispe field is currently producing about 5,950 bbl. daily and contains about 70 wells.

Do it right away

Unless you have a Dubbs-cracking plant now is the time to start building one if you want to get your full share of next summer's gasoline business, which promises to set new high records

Now, while there is time to get it finished before the big motoring season starts

Get going right away

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
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Refinery Expansion

Mid-South May Move East Texas Refinery to Mississippi

SHREVEPORT, La.—Mid-South Oil & Refining Co. has applied for a charter to operate in the State of Mississippi. If successful in obtaining the charter, the company announces that it will purchase and move to Mississippi, the Overton refinery of the Hurricane Petroleum Co. The plant, with a crude capacity of 5,000 bbl. daily, and a cracking capacity of 2,000 bbl., has been shut down since the company took bankruptcy last year.

Indications are favorable that the refining company will obtain a state charter, since Governor Johnson, upon coming to office last year, cited his personal interest and that of the state's in seeing Mississippi crude refined within the state. Since that time a skimming plant has been erected on the Mississippi River at Vicksburg, but the production of the Tinsley field, Mississippi's principal crude source, is much greater than the plant's capacity. Much Tinsley crude, as a result of a stringent market, has been moved to storage within the past several months.

Efforts Made to Keep Open Bradford Oil Refinery

BRADFORD, Pa.—Efforts are being made to enable the Bradford Oil Refining Co., which suspended runs to stills recently, to resume full operations, according to a statement issued after a 4-hour meeting of directors of the concern at the plant at Foster Brook on January 13. The announcement said: "Steps are being taken by the directors of the Bradford Oil Refining Co. and its bankers to enable the company to resume full operations." The statement was given out by Dr. E. R. Lederer, who has tendered his resignation as president to the board, but who is reported active in efforts to keep the plant alive.

Equity Building 1,000-Bbl. Plant at Jensen, Utah

SALT LAKE CITY, Utah.—Construction of a 1,000-bbl. skimming plant at Jensen, Utah, has been started by Equity Oil Co., the plant to operate on crude oil from the Rangely field of northwestern Colorado. Two storage tanks have been erected at the plant site, crude to be trucked from the field, and operators expect to complete the plant by February 15. The Equity company operates a 300-bbl. skimming plant at Salt Lake City, which is also processing Rangely crude at this time.

Falls City Plant Operating At Near-Capacity Level

FALLS CITY, Neb.—The plant of the Mid-States Refining Co. near here was recently completed and is now operating at near its capacity of 2,500 bbl. daily. The plant is processing crude from the Falls City pool, to which a carrier was laid by Independent Pipe Line Co. A line was laid from the plant to the Missouri Pacific tracks at Falls City for loading out finished products.

Union Oil Building New Units at Oleum Plant

LOS ANGELES, Calif.—At its Oleum refinery near San Francisco, Union Oil Co. of California is progressing on the construction of a distillation unit to reduce heavy oil to petroleum coke. It also has under construction a catalytic cracking unit. These plants are expected to be placed in operation during the summer of 1941 and will process up to 13,000 bbl. daily. Present crude-oil capacity of the Oleum refinery is 34,000 bbl.

Natural Gas

Texas Natural-Gas Production Continues Gain in November

AUSTIN, Tex.—Daily average production of natural gas in Texas during November 1940 amounted to 4,506,389 M.c.f. (billions), according to a report issued last week by the Oil and Gas Division of the Railroad Commission. The November figure represented an increase over the previous month of 98,682 M.c.f. daily.

Pipe-line runs accounted for 33.52 per cent of November production compared to 29.45 per cent during October; November runs amounting to 1,510,648 M.c.f. and October 1,298,076 M.c.f. A year ago pipe lines during the same period took 1,466,540 M.c.f. or 44,108 M.c.f. less than November 1940.

Natural-gasoline plant production was off 170,729 gal. compared to October while the volume of gas taken by plants showed an increase of 40,060 M.c.f. or 2,537,898 M.c.f. compared to 2,497,838 M.c.f. This increase in throughput of gas compared to the percentage recovery indicates a recovery loss of 0.076 gal. of M.c.f. gas or a decrease from 0.941 gal. during October to 0.838 gal. per M.c.f. recovered in October. Compared to November a year ago production was off 96,669 gal. daily, and gas put through was off 69,801 M.c.f.

Thirty-seven carbon-black plants reported, during the month of November, a production of 1,233,770 lb. of black. This amount was 82,003 lb. under the October figures. Residue gas taken by these plants amounted to 845,195 M.c.f. compared to 889,549 during October, a decrease of 44,354 M.c.f. daily. A year ago 1,365,195 lb. of black were produced in the same month, a decrease for November 1940 of 131,425 lb.

Thirty-three plants reported repressuring and recycling operation during November; the total volume of gas processed amounted to 1,206,088 M.c.f. daily. This included production from 39 wells, 10 more than last month and an increase in volume of 37,607 M.c.f. daily. Total plant production averaged 22,514 bbl. daily, of which 12,975 bbl. was gasoline.

Cities Service Asks Court for Lower Capitalization Fee

TOPEKA, Kans.—The Kansas Supreme Court has been asked by Cities Service Gas Co. for an order compelling Secretary of State Frank J. Ryan to accept a capitalization fee based on the amount the company proposes to use in the state rather than the amount actually used in 1929. Expenditures by Cities Service in Kansas for 1929 were the highest in recent years.

Roland Boynton, former Kansas attorney general, now acting for Cities Service, said the firm increased its capitalization in 1927 but through an oversight failed to pay the required fee. The mistake was discovered last year and the firm tendered a sum based on the capital it proposed in 1927 to use in Kansas. Mr. Ryan declined to accept it and demanded a fee based on the amount of capital actually used in 1929.

Natural Gasoline

Construction Rapidly Proceeding At La Gloria Recycling Plant

CORPUS CHRISTI, Tex.—Construction of a 200,000,000-cu. ft. recycling plant by La Gloria Corp. in the La Gloria field of Jim Wells and Brooks counties, 3½ miles northwest of Falfurrias, is proceeding rapidly with completion scheduled within the next couple of months. Construction work was started late in October 1940, with Hudson Engineering Co. of Houston receiving the contract. The La Gloria company was organized by Robert T. Wilson of Corpus Christi; Clyde Alexander of Dallas, Tex., and John Sheeran of San Antonio, Tex., who also are associated with the Corpus Christi Corp., Coastal Recycling Corp., and Gulf Plains Corp.

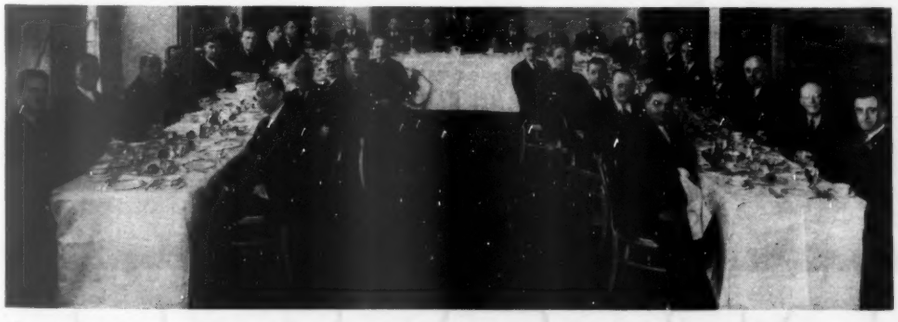
Acreage in the La Gloria field has been unitized and the project involves the drilling of some 25 wells, of which 4 have been completed and 2 are nearing completion. Most of the acreage in the field is owned by Phillips Petroleum Co., Magnolia Petroleum Co., and Ohio Oil Co.

Gulf States to Build Recycling Plant at Edinburg, Tex.

HOUSTON, Tex.—Construction work on a 36,000,000-cu. ft. gas-recycling plant in the Edinburg field of Southwest Texas is expected to be started soon by Gulf States Oil Co. The $225,000 plant is to be build on a subcontract basis.

News of Pipe-Line Activity, which was formerly found on this page, will be found on Page 57.

COMMITTEE MEMBERS OF A.G.A. NATURAL-GAS SECTION MEET

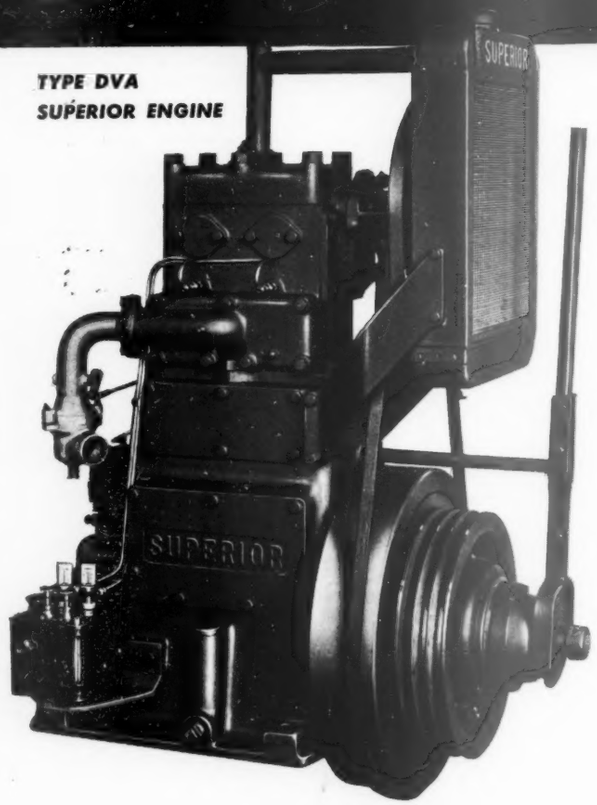


At St. Louis, Mo., on January 6 the executive and managing committees, accident-prevention subcommittee, industrial and commercial-gas sales committee, main technical and research committee, and the general program committee of the natural gas section of the American Gas Association met to discuss plans for its annual meeting in Dallas, Tex., on May 7, 1941.

The program for this thirty-sixth annual natural-gas meeting has been fully outlined and, from the subjects and speakers selected for the various sessions and conferences, the natural-gas man can be assured that his 3 days in Dallas will be packed with interesting and recent information on trends in the natural-gas industry. It is again planned to use the symposium for subject presentation since this method guarantees a complete and open discussion of problems which face the operating man. Speakers of national reputation in research, advertising, etc., are scheduled.

In the photograph are shown members of the various committees at the luncheon meeting in St. Louis.

Superior ENGINES... Coordinated



TYPE DVA
SUPERIOR ENGINE

PROPER engine selection for Unit Pumper Operation is a most important contributing factor in low-cost pumping.

Superior slow and medium speed engines are giving operators in many fields reliable and economical performance in connection with National Unit Pumpers.

The simple and accessible design of these engines eliminates the necessity of a special operator. The pumper can perform required servicing. Slow and medium speeds with conservative ratings are favorable to trouble-free service, low operating costs and long life.

Call the National representative in your locality for consultation on pumping problems—No obligation is incurred.

TYPE CM
SUPERIOR ENGINE

ENGINE SPECIFICATIONS

SUPERIOR TYPE DVA		SUPERIOR TYPE E	
Size, Bore x Stroke	4" x 5"	Size, Bore x Stroke	5" x 6"
R.P.M.	700	R.P.M.	700
Rated B.H.P.	10	Rated B.H.P.	20
Recommended for use with TU234-JD23TB National Unit Pumper.		Recommended for use with TU304-HD30TB National Unit Pumper.	

SUPERIOR TYPE CM

Size, Bore x Stroke	6½" x 8"				7½" x 10"				
R.P.M.	250	300	400	500	250	300	350	400	450
Rated B.H.P.—Gas	7.5	9.0	12.0	15.0	12.5	15.0	17.5	20.0	22.5
Rated B.H.P.—Oil	6.5	7.8	10.4	13.0	10.7	12.8	15.0	17.1	19.3

Type CM-6½" x 8" is recommended for use with TU234-JD23TB and Type CM-7½" x 10" with TU304-HD30TB National Unit Pumpers.

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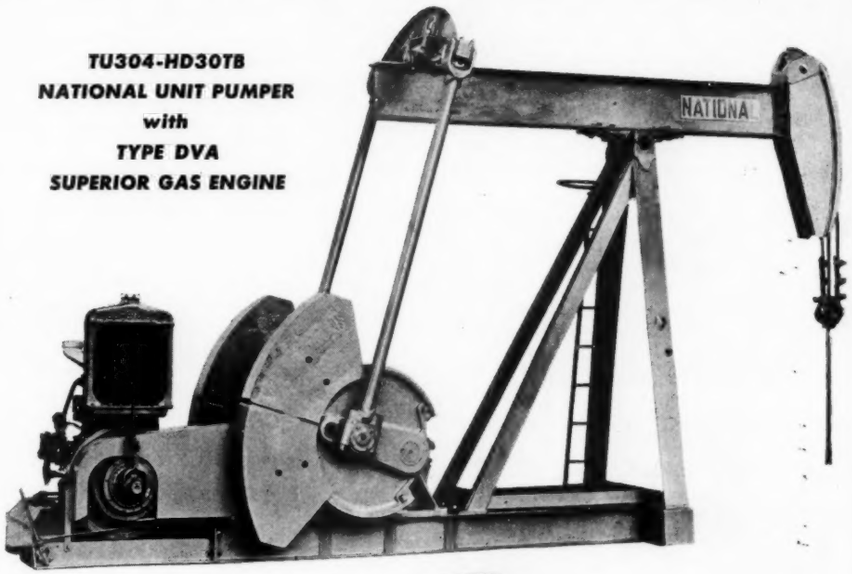
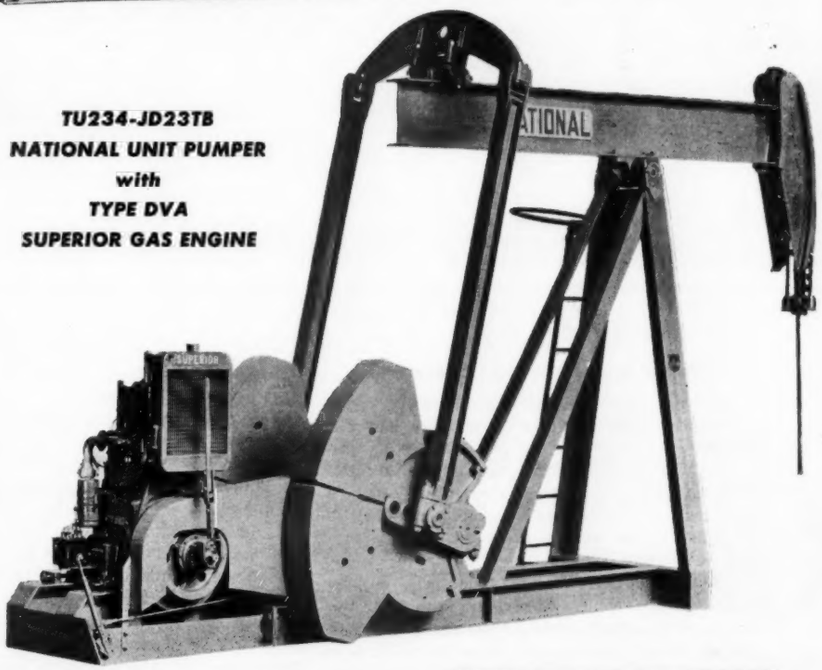
The economy of unit pumping depends greatly upon the choice of a Unit Pumper that is engineered to fit the individual pumping requirement.

The National line of Unit Pumpers is complete —12 sizes—in a range of capacities to dependably and efficiently meet any unit pumping specification with a minimum of operating and maintenance expense.

For lower ultimate lifting cost investigate the economies of Superior Engine powered National Unit Pumpers.



TU304-HD30TB
NATIONAL UNIT PUMPER
with
TYPE DVA
SUPERIOR GAS ENGINE



TU234-JD23TB
NATIONAL UNIT PUMPER
with
TYPE DVA
SUPERIOR GAS ENGINE

PUMPER SPECIFICATIONS

TYPE	TU234-JD23TB	TU304-HD30TB
A.P.I. safe load of walking beam, lbs.	9,125	12,750
Polished rod strokes, inches	27-34½-42	33-40½-48
Max. counterweight effect at max. polished rod stroke, lbs.	5600	8480
Over-all counterweight swing, max., inches	43	48
Reduction Gear:		
A.P.I. peak torque rating at 20 spm., in. lbs.	57,200	76,500
Over-all gear ratio	29.8	29.6
Crankshaft diameter at bearings, inches	4½	5
V-belt sheave pitch dia. inches by number and section of belts	18x3c	18x4c
V-belt sheave pitch diam., max., inches	23	26
Well end working centers	5'3"	6'0"
Walking beam size and weight, CB section	14"x42 lbs.	16"x58 lbs.
Recommended Type Superior Engine	DVA or CM 6½x8	CM 7½x10 or E

NATIONAL SUPPLY COMPANY

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THE NATIONAL SUPPLY CORPORATION
30 ROCKEFELLER PLAZA
NEW YORK, N. Y. . . . U. S. A.
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MARACAIBO, VENEZUELA

Pros and Cons of Proration of Condensate Production

(Continued from Page 12)

tión of prorating—that with a few exceptions, the preponderant number of recycling plants have been built by "little fellows" and not by the larger operators. These people put their money into this new industry before it was definitely established how much they could expect to get out of it. For even today, in the case of most fields, there are major differences of opinion on the part of the experts, as to how much of the condensate reserves will be produced from many of the reservoirs. The elements of risk are many, and considerably in excess of those taken by a producer of oil in a proven field, or by a natural-gasoline manufacturer.*

*Exclusive of the cost of wells drilled specifically for recycling operations — and that is a figure nearly as great—approximately $15,000,000 is now invested in, or committed for plants and facilities. Apart from the moneys expended during construction, hundreds of families are maintained by employment in these plants.

It should be borne in mind, too, that these investments in plants were made on the basis of permits granted by the authorized agency of the state in conformance with laws of the state, which specifically permit the production of natural gas for "the extraction of natural gasoline therefrom when the residue is returned to the horizon from which it is produced" (6008-7d 1936, Texas Annotated Statutes).

The same act declares that "the commission shall be vested with a broad discretion in administering this law"—the law to control gas and oil production and to prevent waste. Permits to recycle gas as issued by the commission include provisions which leave no question about its continuing authority over and observation of the operation, to see that waste is not practiced. There is however, in these grants not one iota of an implication that the permit would be modified at any future time if the operator pursued his operations without waste. On the contrary there was a definite encouragement given to this type of operation, frequently a commendation that the authorized operation was in the interest of conservation.

Recycling Is Optimum in Conservation

Under present Texas law casinghead gas may be produced with oil from an oil well and the gasoline extracted from the gas and the dry gas used or wasted. Gas from a gas well may be produced up to 25 per cent of its open-flow capacity if the producer has a legal market or use for the gas. This gas, too, may be processed to extract its gasoline content. There is no limitation except that recited here as to how much gas may be produced and of course there is no limit upon the amount of gasoline which can be extracted from this gas. It is byproduct or incidental production and all of it that is saved is for the public good. Under the law, a gas-distillate gas well may be produced with the same limitations as any other gas well, and the gas may be sold into any legal industrial market. The limitation upon this production, other than what has been stated above is the limit of the market alone, provided there is no waste in the production practice. Again, there is no limitation whatsoever upon the amount of condensate which the producer may remove from the gas so produced and sold. The saving of the condensate up to its economic maximum is good practice and should be encouraged.

If this simple thesis is correct, it would be untenable to impose greater restrictions than the law now sanctions upon the owner of a gas-distillate gas reserve who, in light of the scientific fact that a reduction of the pressure in the gas reservoir will cause the liquefaction of condensate therein, lost to future recovery, chooses to sacrifice immediate sales from his reserve and instead installs expensive equipment to extract the condensate from all of the gas at the same time maintaining substantially reservoir pressure in the reservoir, before disposing of any substantial quantities of gas from the reserves. Would it not be a travesty on justice to penalize the operator who practices conservation at its optimum?

This is not a hypothetical assumption. Every owner of a gas reserve hopes ultimately to find a market for his gas through the channels of those transportation systems which carry gas from the field to the great markets of the country. Some reservoirs have already been depleted. Some are now being drained and presently untouched sources of supply will be tapped. Projects even now under consideration involve the transportation of huge quantities of gas from the remotest sections of Southwest Texas. It so happens that some of the very large gas reservoirs are gas-distillate gas reservoirs. The gradual withdrawal of gas from these fields and the diminution of pressure in the reservoirs will result in great and extraordinary waste in the reservoirs. The recycling or conditioning of this gas should not only not be restricted, but it should be encouraged. The development of an industrial market for this gas should of course not be impeded.

Future Developments

There is another and not unimportant reason why the present agitation should not be allowed to stampede the lawmakers into passing restrictive laws on this new industry, and that is the future progress of recycling. If the rate of increase in condensate production from plants has been recorded in seemingly large figures, the actual production as distinguished from the rate of increase is of no great consequence. The monthly variation in total crude-oil production in Texas may, and generally does, several times exceed the total production of condensate. There is at this time less than 25,000 bbl. of condensate production daily. The past 3 years have seen the building of fewer than 30 plants in Texas which some time in 1941 will yield a production of approximately 35,000 bbl. a day, for Texas, a figure representing about 2½ per cent of the total production of that state. When this volume is reached no new situations will be in sight, for the plants which will have been built by late 1941 represent in the main distillate fields from among the hundreds discovered up to this time which could be commercially exploited by processes available today. In general, the remainder of the fields are too small or contain too lean gas to justify their present development. Some marginal projects will be developed when prices improve. And, of course, as deep drilling is increasingly continued, new fields will be discovered. But the boom-size development is over. The volume of production may be said to have become stabilized. Decline in older plants should effect normal new developments.

Conclusion

But one conclusion is indicated from this discussion. Present recycling operations are manifestly conducted without waste. The volume of condensate does not appear to have usurped an untoward proportion of the available gasoline demand. The finished products of a recycling plant are properly no more subject to proration than a plant processing crude oil.

Present statutes appear adequate to provide the principles under which the Railroad Commission can supervise the exploitation of condensate reserves without waste of either condensate or gas. The commission has executed these laws with discretion and understanding. It has done more. Its encouragement of recycling and its active assistance have not been the least factors in adding to our recoverable petroleum reserves by the development of what is looked upon as a production philosophy which transcends all others in the practice of conservation.

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Anse La Butte Salt Dome Shows Brisk Development

(Continued from Page 15)

4,500 to 4,800 ft., being farther out and down structure on the dome from the other sands. At places the sand has a thickness of as much as 200 to 300 ft. It has at 38 per cent porosity and is expected to have an ultimate recovery of around 2,000 bbl. per acre-foot. Like the Breaux sand, it was opened by Glassell & Glassell, whose discovery well was located on the Moresi (Patin) tract.

Shortly after the opening of the Patin sand, Otis Dyer, in a test, 1 Patrick, located on the far eastern side of the field, completed a well in a sand at 3,637-47 ft., opening the Patrick sand. The sand was found just above the salt, which was topped at 3,665 ft., and into which the test drilled to a total depth of 3,701 ft. Initial production of the well was at the rate of 205 bbl. daily through a ¼-in. choke.

So far, only one well each has been completed in the second Moresi and Bergeron sands. The discovery well of the former sand was Iberia Petroleum Co. 2-A Moresi, located on the south side of the dome, which was completed in June flowing at the rate of 403 bbl. daily through a ¼-in. choke. Total depth was 2,915 ft., with sand at 2,848-96 ft. Location of the well was too far out for the first Moresi sand, in which water was found, and in drilling deeper in exploration for the Patin sand it opened the intermediate horizon. The Bergeron sand was opened by Stanolind Oil & Gas Co. 1 D. Bergeron, also on the southeast side of the dome, in the Patin sand area, which was completed in July in sand at 3,240-70 ft., flowing 129 bbl. daily through a ¼-in. choke. It was started as a Patin sand test but found the shallower sand.

Gravity of the oil produced from the Breaux sand is from 38° to 39° A.P.I.; that from the Patin and Patrick sands, 36° to 37° A.P.I.; that from the Bergeron sand, 37° to 38°; the second Moresi sand, 30° A.P.I., and the first Moresi sand, 24.8° A.P.I.

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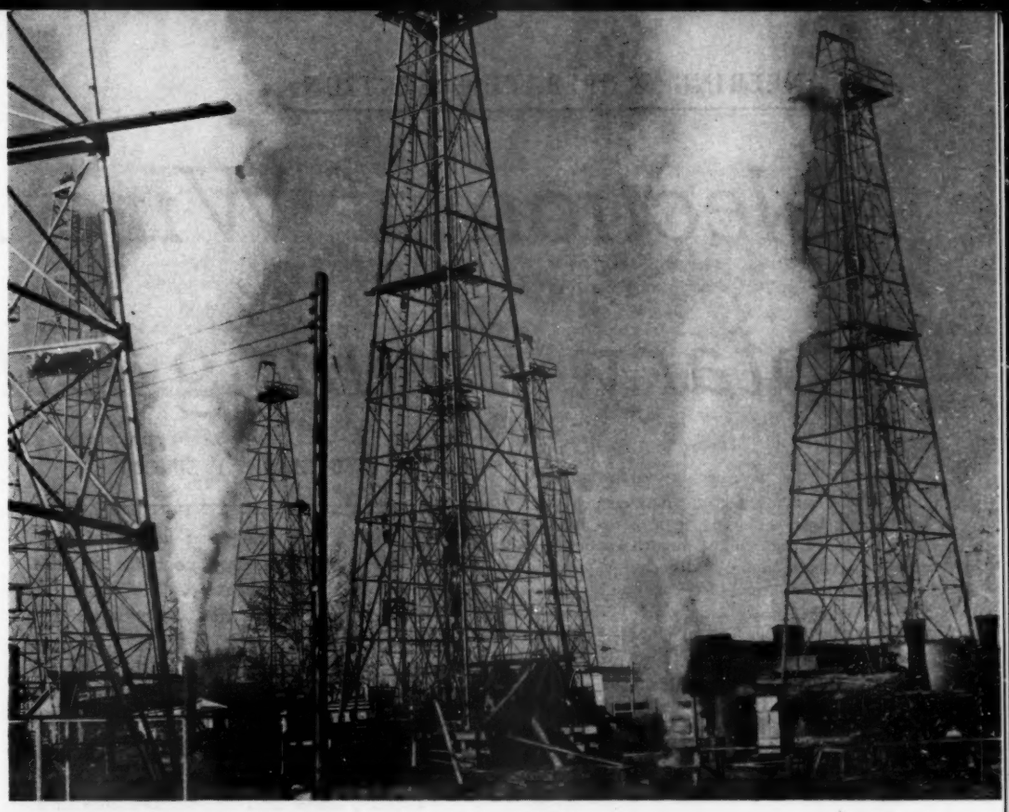
Magnolia Adopts 100 Per Cent Tank-Table Buying Policy

DALLAS, Tex., Jan. 21.—Magnolia Petroleum Co. will institute a crude-oil policy in Oklahoma February 1 based on 100 per cent of tank tables. The new Magnolia policy will follow the Texas Co. plan, providing full deductions for contamination and volume corrections for temperature.

February Crude-Oil Demand Estimated at 3,628,900 Bbl. Daily

WASHINGTON, D. C., Jan. 21.—Domestic demand for crude oil in February will be 3,628,900 bbl. daily, an increase of 37,900 bbl. over January, according to the Bureau of Mines estimate released today. The February demand is 1 per cent above the actual for the same month last year.



After a decided drop in activity in 1940, drilling in the East Texas field is increasing due largely to the recent Supreme Court decision upholding the Texas Railroad Commission's proration methods. From the photograph some idea of the density of drilling in the Kilgore townsite area, and of the light type of rotary equipment being used, may be gained

ENGINEERING & OPERATION

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DRILLING HORIZONTAL WELLS FROM A VERTICAL SHAFT
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Selection of Wire Rope for Rotary Drilling Lines

By HARRY F. SIMONS

This is the first in a series of four articles on wire rope used for drilling lines in the oil industry. The construction, manufacture and selection of the proper wire rope for a particular job are discussed here. In subsequent issues of The Oil and Gas Journal articles will deal with: (1) Factors Affecting Wear of Rotary Drilling Lines, (2) Installation of Wire Rope Used for Rotary Drilling Lines and (3) Maintenance and Operation of Rotary Drilling Lines.

WIRE rope has been used in industry since 1834 when a German engineer made a wire rope of strands having iron wires for use in a coal mine. Large cables have been built for various purposes, including those for suspension of bridges, but it remained for the oil industry to show what punishment could be meted out to this particular piece of machinery. True, the size of the wire ropes used in the drilling of oil wells is not large, as wire ropes go, but because of the severity of service their life is short and the total tonnage used annually mounts to a high figure.

As a great bulk of the footage drilled at the present time is by the rotary method, it is this branch of the oil industry which uses the most wire rope. In addition to the drilling lines there are bailing and coring lines, swab lines, tong lines and sometimes auxiliary lines used on a rotary rig; because of the service which it receives, the drilling line is the most important, the costliest and the one which is replaced the most often. In rotary service, a bailing line, or swab line may last for many months and tong lines must be replaced only at long intervals. Drilling lines are retired when inspection shows them to be no longer safe. This may be at the end of a deep well or it may be after several shallow wells have been drilled; comparison of line service is made by estimating the number of ton miles obtained from each line.

Two types of rope construction. Above: Regular right lay in which the wires in the strands are twisted in the direction opposite to that of the strands in the rope. Below: Lang-lay line in which the wires in the strands are twisted in the same direction as the strands in the rope

Types of Lines

As far as the rotary-drilling industry is concerned there are two types of wire lines used. One is the 6 by 19 Seale type, regular right lay, round-strand construction and the other is the 6 by 19 Seale, Lang lay, flattened-strand construction; the latter is generally furnished preformed. The 6 by 19 Seale type wire line has six strands, each strand of which consists of a core wire surrounded by nine inner wires of uniform but relatively small size and on the outside by nine wires of uniform but relatively larger size.[1] Variations of this type line (used elsewhere than in the oil industry) may have a different number of wires than nine but the principle of construction remains the same. The term "Seale" means that there are two layers of interlocking wire, the outer layer laying in the valleys of the layer beneath. For ropes of the same diameter the outer wires of a Seale constructed rope are larger components of the strand and thus offer more resistance to abrasion. High resistance to abrasion is particularly important in the drilling industry.

The flattened-strand construction is made up of strands that have a triangular instead of a round cross-section. The object of this construction is to expose a greater percentage of the wire surface to abrasion and to make a more compact rope.

The lay of the rope is the direction in which it is closed, the right lay being closed with a right-hand turn and the left lay by turning in the opposite direction. The lay can be determined by observation, the strands in a right-lay rope running from left to right across the top when passing away from the observer. The left lay crosses from right to left. The wires in the individual strands may be either the same lay or the opposite lay but it is the strands which determine whether the rope is right or left lay. Only right-lay ropes are used in rotary drilling but in some areas cable-tool men prefer left-lay lines.

The term "regular lay" denotes that the wires in the strand are twisted in the direction opposite to the direction of twists of the rope itself. If the wires in the strand are twisted in the same direction as the strands in the rope, it is called a "Lang lay" rope. Here again the regular lay is used almost exclusively in the round-strand construction.

Some engineers have expressed doubt as to whether the drilling industry is using the proper type rope. Brantly[2] several years ago stated that Lang lay was coming into wider use and, except for its tendency to twist the blocks in the derrick, is theoretically and practically a better line than the regular lay because of the greater bearing surface of the individual wires on the sheaves. The tendency to twist may be overcome by preforming.

One author[3] states that the wear is distributed differently in the two types of ropes and the analysis shows that the radius of curvature of the individual wires gives the Lang-lay rope a definite advantage by having lower fiber stresses in the outside wires when the ropes are bent around sheaves of equal diameter. Another engineer points out that any tension or stress in the wires of the two types of rope will be identical but when passing over sheaves, Lang-lay ropes have better bending properties. This is credited to the fact that the wearing surface is greater and the unit radial pressures are consequently lower, thus permitting better adjustment of the component wires and strands to the bend.

Lang-lay ropes made from round strands may have theoretical merits over regular lay lines of the same construction but this type of rope has not proven generally successful or economical for rotary-drilling service. The discussion introduced

Eight lines strung through the block on second deepest test in the world. In the drilling of this test the drilling line was replaced several times

here is not intended to give fully the merits of both types of lays but simply to indicate that to most manufacturers, and some users, this is a live subject and efforts are being made to obtain the best wire rope possible; also that the widespread use of regular-lay lines is strictly a matter of economical service.

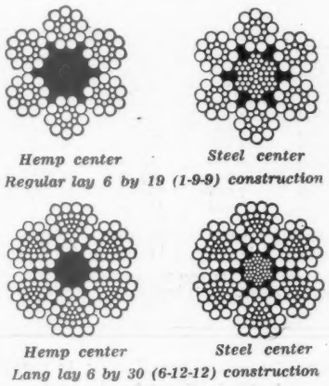
Materials

There are several grades and different materials used in wire-rope construction. These range from cast steel to the improved plow-steel grade. The following table shows strength of each type of material used in building wire ropes:

APPROXIMATE RANGE OF STRENGTH
(Pounds per square inch)

Grade—	A.P.I. grade		
Cast steel	N	170,000	220,000
Mild plow steel	L	190,000	240,000
Plow steel	J	210,000	260,000
Improved plow steel		230,000	280,000

Here again the oil industry generally uses only one grade, the improved plow steel, because of its high strength. The exception is in California where Grade J plow-steel lines are rather widely used for rotary drilling. Manufacturers do not recommend the use of plow-steel and mild plow-steel lines unless they are certain that an adequate factor of safety is present and that satisfactory service will result. Where a large factor of safety is present and conditions generally are at an optimum, satisfactory service may be obtained from these two grades. Generally, the desired factor of safety is present only when the best line available is used and for that reason and because of better service obtained approximately 90 per cent of the wire ropes used for rotary-drilling lines are of the improved plow-steel grade.



Hemp center *Steel center*
Regular lay 6 by 19 (1-9-9) construction

Hemp center *Steel center*
Lang lay 6 by 30 (6-12-12) construction

Cross-sections of different types of wire rope used for drilling lines

The breaking strength of various grades and sizes of wire rope has been tabulated by the A.P.I. as shown in Table 1.

These do not include the improved plow-steel grade which has the specifications shown in Table 2.

Use of the best grade material, and consequently the most expensive rope, is not an affectation but is a necessity as the ropes are used for an extremely heavy running load, subjected to severe and sudden overloads, rapid acceleration and deceleration and high speeds. If ropes of lesser quality were used, the minimum safety factor of 5 would not be present when new unless the ropes were impractically large and the rope would consequently wear quicker and have to be discarded after a comparatively short life. The changing of ropes requires considerable time and any extra cost is more than offset by this saving. Another important factor is the danger of failure of a rope which would cause extensive damages to the personnel and the machinery and might even cause abandoning of the hole.

Two types of centers are used in the drilling industry, the hemp center and the steel center. The hemp center is made of either three or four strands of one of the hard fibers, either java sisal or manila rope and produces a flexible wire line. The steel center is made with six small seven-wire strands laid around a small hemp center or another seven-wire strand. The steel-center rope is less flexible to the feel but it does resist drum crushing more readily than the fiber-centered ropes. It also has a higher ultimate breaking strength. (See diagrams on this page.)

Ropes winding in multiple layers on small drums and passing around sheaves of comparatively small diameter under heavy loads, are subjected to extremely heavy radial pressures.[4] Hemp-centered ropes, under such conditions, become distorted from their true circular section and cannot maintain the necessary support for the strands and the line becomes flattened. In such cases, an independent wire rope center becomes a necessity if the proper amount of service is to be obtained from the line. The wire-center rope has approximately 7½ per cent more strength than the hemp-center rope.

Left: Looking down from fourble board of rig on which six lines are strung through block; note that the block is slightly twisted. Right: Looking up at crown block on which 1⅛-in. line is used. The sheaves are close to the permissible minimum for that size line. The picture was taken while the bit was on bottom but note the movement of the lines

Manufacture of Wire Rope

Manufacture of wire lines is a big industry and includes many processes. A large number of books and technical papers have been written covering the subject.[1,2,5] The process used is practically the same in all plants.

Suitable wire rope of a certain grade can be made from steels having a chemical analysis of relatively wide range varying from 0.35 to 0.80 per cent carbon for cast steel to improved plow steel.

The steel is made in an open-hearth furnace, after which the ingots are hot-rolled into blooms and from blooms to billets and then the latter are hot-rolled down to rods measuring from 1/5 in. to ⅜ in. in diameter. The rods are then prepared for drawing by patenting,[5] or heat treating, to assure a uniform structure and the physical structure necessary for cold-wire drawing.

The rods are then cleaned of scale, coated with lime, and baked to set the coating. For drawing, the rods are pointed on the end and started through the conical holes in the dies. The drawing process is repeated until the desired size wire having particular characteristics wanted, is obtained. Interim patenting may be necessary as the wire hardens with each draft.

Finished wire is wound on bobbins and sent to the stranding machine from which emerges the strands. Torsion of the wires as they are laid in the strands is prevented as the bobbins hold their parallelism. The strands on spools are then taken to the closing machine.

The closing machine consists of a large unit equipped with cradles in which are held the spools of finished strands. This unit is rotated when the rope is being made and the rope is pulled through a die of the proper size, the power being furnished by a capstan over which the rope is reeved and which is in essence a traction or friction pulling unit.

The lay of the rope is governed by the speed of the rotating unit and the speed of the capstan drum. The finished rope is given a final inspection. It is obvious that the strength of the finished rope is somewhat less than the aggregate strength of the wires composing it. In other words, there is a certain loss in strength due to the laying of the wires in the strands and the strands in the rope.

TABLE 1—ULTIMATE STRENGTH OF 6 BY 19 ROPES

Nominal diameter of rope (in.)	Approximate weight lb., per ft.	Grade N lb.	Grade L lb.	Grade J lb.
⅜	.23	9,000	10,000	11,000
7/16	.31	12,000	13,200	14,600
½	.40	15,400	17,000	18,800
9/16	.51	19,200	21,200	23,400
⅝	.63	23,600	26,200	28,800
¾	.90	33,600	37,400	41,200
⅞	1.23	45,600	50,800	56,000
1	1.60	59,000	66,000	73,000
1⅛	2.03	74,000	83,000	92,000
1¼	2.50	92,000	102,000	113,000
1⅜	3.03	110,000	123,000	136,000
1½	3.60	130,000	145,000	161,000

TABLE 2—SPECIFICATIONS OF IMPROVED PLOW-STEEL GRADE ROPE

Diameter in inches	Approximate circumference in inches	Approximate weight per foot in in pounds	Breaking strength in pounds
⅜	1⅛	.23	12,600
7/16	1⅜	.31	16,800
½	1⅝	.40	21,600
9/16	1¾	.51	27,000
⅝	2	.63	33,200
¾	2⅜	.90	47,400
⅞	2¾	1.23	64,400
1	3⅛	1.60	84,000
1⅛	3½	2.03	106,000
1¼	3⅞	2.50	130,000
1⅜	4⅜	3.03	157,000
1½	4¾	3.60	185,000

Preformed Rope

In recent years preformed rope has been offered to the drilling industry and in the past few years its use has become more widespread.

In preforming, the strands are passed through a special preforming head just before entering the closing die. Here they are formed into the exact helical shape they will need to occupy their curved position in the finished wire rope. This

means the strands can be laid together rather than twisted together by force.

The result of preforming is the elimination of internal stresses induced in the individual wires of the strands during the fabrication of the strands and rope. The unit wires and strands in the rope are "in a state of ease" and field experience has proven that the greatest advantages of preforming rope is the increased bending-life properties of the rope. Further results show that a preformed rope is easier to handle, will spool on the drum more evenly, crankiness is reduced to a minimum, the line has less tendency to whip when pulling the empty blocks, twisting of the blocks is practically eliminated, and the rope will generally withstand more abuse from overwinding on the drum. An incidental safety feature is due to the fact that the wickers will not project and cut a man's hand or get in his eye or face.

Maximum benefits of preforming are obtained in an independent-wire-rope-center rope as it will be more flexible than one which is not preformed. Lang-lay lines have long been noted for their crankiness which is the main objection to their use in a drilling-derrick. However, preforming will eliminate most of the trouble from this source and, because of its greater wearing qualities as pointed out above, the preformed Lang-lay wire rope may find favor in the oil field.

Each strand of the wire rope and the core, whether hemp or steel, is lubricated during the manufacture of the line. The amount of service obtained from a line will depend nearly as much on the thoroughness of lubrication as it will on other factors. The wire rope is protected from corrosive influences and the friction between the strands, which causes most of the breakage, is reduced to a minimum by lubrication.

In the field, lubrication of wire ropes is advisable and longer service could be obtained from each line if a sensible lubrication practice were established. However, such a practice does not generally exist at this time, therefore the manufacturers try to put enough lubricant in and on the rope to last the life of the wire line. It is difficult to provide lubrication which will in all cases last the life of the wire rope although the manufacturers strive to do all they can in this direction. While the life of a rotary-drilling line is short, many lines would give increased service if they were properly lubricated in the field.

Length of Line

The length of rotary lines depend on the depth of the well, the size of the derrick, and size of drill pipe to be used. The minimum length which it is possible to use can be obtained by multiplying the number of lines to be strung through the blocks plus 2 by the height of the derrick, plus ½ the circumference of the sheaves, plus a suitable amount for anchoring on the drum and dead ends. The practice in the field is to buy a longer line than is needed for stringing the blocks as this allows the line to be cut off a large number of times and the line will be worn throughout its entire length before it gets too short for use.

If the well is to be started with a small number of lines and more lines strung through the blocks as depth increases, a line long enough for the increased stringing is generally purchased. Ends of the line can be switched while the addition to the number of lines is being made. In this way, one drilling line may be all that is needed for the drilling of a deep well.

In addition to the load the diameter of the sheave tread and of the drum will determine the size of the line and whether it should be steel or hemp center. The smallest line possible having the desired safety factor is used. This brings the line and sheave closer to the proper relationship. For 6 by 19 construction, the sheave tread diameter should be 45 times the rope diameter and as high as 90 times if high speeds and heavy loads (such as encountered in drilling) are expected. A minimum of 30 times the diameter of the wire rope is possible although a line used with such a small sheave will give poor service. As the size of the sheaves in the crown block and traveling block are limited, it is evident the operator is restricted to the choice of rope he can use. If the sheave groove is not the correct size, the alternative is to change sheaves (sometimes requiring a change in blocks) or use a different size line.

Size of Line Needed

In the purchase of wire lines and the selection of the sheave grooves in the blocks it is necessary to know the size of the line required to meet the load to be encountered on the well. Table 3 gives the length of various sizes of pipe which can be safely used with any size wire line and any number of lines strung through the block.

In determining the size line to be needed, the depth of the well, the weight of the blocks, hook and swivel, and the friction losses in the blocks must be considered. While dividing the hook load by the number of lines strung through the blocks will give an approximate figure for the load on the fast (lead) line, it entails considerable error and should only be used when an adequate factor of safety is present.

If there is any doubt, a formula for determining the loss in the sheaves and in the line can be used. Per cent efficiency (E) can be computed as follows:

$$E = \frac{1}{(1.04)^{(N-1)}}$$

Where N = number of lines strung through the blocks. The fast-line pull factor (F) is found by the following:

$$F = \frac{1}{N \times E}$$

The fast-line pull = weight lifted X F.

Following are values of E and F for various number of lines strung through the blocks:

Number of lines, N	4	6	8	10	12
Efficiency per cent, E	88.89	82.19	75.99	70.25	64.96
Fast-line pull factor F	.2812	.2027	.1645	.1423	.1283

If the maximum load (drill pipe plus blocks) is to be 160,000 lb. and the eight lines are to be strung through the blocks, the maximum stress on the fast line will be 160,000 lb. × .1645 = 26,320 lb. By referring to the tables giving the ultimate strength of various size lines it is readily seen that the only 1⅛-in. line (the size most commonly used in the oil field) having the desired safety factor is the improved plow-steel grade. When 75 per cent of the strength is left in the line, the factor of safety will be less than four.

Formulas in Kent's Mechanical Engineers Handbook, 1938 edition, Volume 2, "Design and Shop Practice," present other means of computing the efficiency of the block system. The formula is:

$$P = \frac{Wk^n(k-1)}{(k^n-1)}$$

Where:

P = lead-line pull in pounds
W = weight lifted in pounds
k = factor derived by another formula
n = number of parts of rope at movable blocks
$k = 1 + 0.225\,(d/R) + 0.16\,(r/R)$ where:
d = diameter of wire rope in inches
R = radius of bending of rope on sheave in inches
r = half diameter of sheave pin in inches.

The loss in efficiency is also shown in a table for different number of lines strung through the blocks. With a four-line string-up the efficiency is 76 per cent, with six lines it is 68 per cent. For eight lines it would be approximately 60 per cent.

When it is remembered that in addition to the drill-pipe load there is often the pull necessary to work, or free, stuck drill pipe and frequent shock loads on the line, a safety factor of 5 is none too great.

TABLE 3—ALLOWABLE DRILL-PIPE LENGTHS FOR STEEL ROTARY-DRILLING LINES

Line size		1-in.				1⅛-in.				1¼-in.			
Lines up		6	8	10	12	6	8	10	12	6	8	10	12
Max. line load, lb.		89,400	114,300	137,800	158,500	112,800	144,200	173,800	200,000	138,300	176,900	213,200	245,300
Max. drill-pipe load, lb		59,400	84,300	107,800	128,500	82,800	114,200	143,800	170,000	108,300	146,900	183,200	215,300
Drill-pipe size (in.)	Weight of drill pipe (lb. per ft. with couplings)	Feet				Feet				Feet			
8⅝	40	1,485	2,115	2,700	3,215	2,070	2,855	3,595	4,250	2,710	3,675	4,585	5,385
7⅝	29.25	2,030	2,885	3,690	4,400	2,830	3,905	4,920	5,815	3,705	5,025	6,275	7,360
6⅝	31.9	1,865	2,645	3,380	4,030	2,595	3,585	4,510	5,330	3,405	4,605	5,755	6,750
	25.2	2,360	3,345	4,280	5,100	3,285	4,545	5,710	6,750	4,305	5,830	7,285	8,545
	22.2	2,675	3,800	4,860	5,790	3,730	5,155	6,480	7,660	4,885	6,620	8,265	9,700
5½	25.2	2,360	3,345	4,280	5,100	3,285	4,545	5,710	6,750	4,305	5,830	7,285	8,545
	22.2	2,675	3,800	4,860	5,790	3,730	5,155	6,480	7,660	4,885	6,620	8,265	9,700
	19.0	3,130	4,440	5,680	6,765	4,360	6,025	7,570	8,950	5,705	7,735	9,655	11,335
4½	16.6	3,580	5,080	6,500	7,740	4,990	6,885	8,665	10,240	6,530	8,850	11,055	12,970
	13.75	4,320	6,130	7,840	9,345	6,025	8,315	10,460	12,365	7,885	10,685	13,335	15,660
	12.75	4,660	6,615	8,460	10,080	6,495	8,975	11,280	13,335	8,505	11,525	14,405	16,890
3½	13.3	4,470	6,340	8,110	9,665	6,225	8,610	10,815	12,785	8,155	11,045	13,805	16,190
	11.2	5,310	7,530	9,620	11,475	7,395	10,210	12,840	15,130	9,670	13,120	16,385	19,225
	8.5	6,990	9,920	12,690	15,120	9,745	13,455	16,920	20,005	12,755	17,285	21,605	25,330

Note: Maximum load capacity of 1-in., 1⅛-in. and 1¼-in. line with factor of safety of 5 = 16,800, 21,200 and 26,000 lb., respectively. 30,000 lb., estimated average weight of drill collars, drill stem, and traveling-block assemblies deducted from maximum line loads to obtain maximum drill-pipe loads. This table is based on data shown in "A.P.I. Standards No. 9-A: A.P.I. Specification for Wire Rope" dated April 1940.

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Isomerization of Feed Stocks Charged to Alkylation Units

By L. J. COULTHURST
Design Engineer, Foster Wheeler Corp.

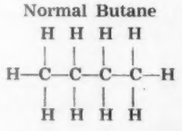
ALKYLATION has become popular in the past year as an effective and efficient method of producing high-octane blending stock which is to be used as the main ingredient in 100-octane aviation gasoline. The process brings about a direct combination of butylenes (C_4H_8) with isobutane (C_4H_{10}) to produce saturated isoparaffin hydrocarbons including isooctane (C_8H_{18}). Not every refiner has easy access to isobutane in commercial quantities for use as alkylation feed stock but nearly every one has an ample supply of normal butane, which is the most abundant of the four-carbon-atom hydrocarbons found in petroleum. It is now commercially practicable to convert most of this normal butane to isobutane by the process of isomerization and thus make possible the alkyiation of large quantities of butylenes that are available.

Chemists have long applied the term "isomerism" to a phenomenon characteristic of many organic compounds, including those occurring in petroleum, which have the same percentage composition and molecular weight, yet exhibiting different physical properties. These compounds are called "isomers," signifying equal measure. In seeking an explanation of this phenomenon, chemists early came to the conclusion that if a molecule of two substances contains the same number and kinds of atoms in the same relative proportions, the difference between the two must be caused by a variation in the arrangement of the atoms within the molecule.

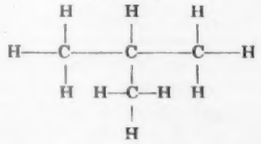
Molecular Rearrangement

For example, there are two substances which have the composition and molecular weight represented by C_4H_{10} (4 carbon atoms and 10 hydrogen atoms combined to form one molecule). It is evident that the formula must be written in two ways if there is to be a distinct differentiation between the two compounds. Two possible arrangements of the atoms in a molecule of this composition suggest themselves and they can be represented thus:

Normal Butane



Isobutane



Graphical formulas such as these, in which the containing power of the elements is represented by a line, are the means by which chemists are able to explain the phenomenon whereby two compounds may have the same proportional and total weight of individual atoms, as is represented by iso and normal butanes.

Some of the basic principles of isomerization were published by a group of Russian chemists 5 years ago.[1] They demonstrated the possibility of rearrangement of low-molecular-weight, straight-chain paraffin and olefin hydrocarbons, in the presence of catalysts and without cracking or polymerization, to form branch-chained isoparaffins. These isomeric compounds are extremely valuable in aviation and automobile fuels since they have higher antiknock values than the normal hydrocarbons, as well as higher susceptibilities to lead treatment. Isobutane, as a branch-chained paraffin hydrocarbon, is no exception with respect to these qualities, but due to its volatility, its use as a component of internal-combustion-engine fuels is extremely limited. Its greatest potential value, however, lies in its availability for feed stock to an alkylation unit in which it is coupled with butylenes to form valuable alkylate.

Commercial Potentialities

Some idea as to the commercial potentialities of isomerization of normal butane to isobutane may be obtained from a recent publication of laboratory results reported by two Russian research chemists.[2] The tests demonstrated that, in liquid-phase operation, approximately 74 per cent of the normal butane may be converted to isobutane by isomerization at 158° F. using a mixed catalyst, $CuSO_4.2HCL$ plus aluminum chloride ($AlCl_3$). Since these tests were made in closed tubes, the 74 per cent conversion of normal to isobutane is an indication of equilibrium concentrations which is the maximum conversion to be expected by recycle operation.

At the same time that the liquid-phase tests were made, even a larger number of experiments were conducted in the vapor phase over a temperature range from 158° to 356° F. Aluminum chloride alone was used as the catalyst with anhydrous hydrochloric acid added to the normal butane feed in order to maintain proper activity of the catalyst. In the temperature range of 158° to 230° F., the chemists reported substantially no byproducts while at higher temperatures some propane is found. The tests would indicate, therefore, that operation from 158° to 230° F. is to be preferred. The results of operation in the vapor phase at 266° F. showed 37.2 per cent conversion with single-pass operation and a maximum of 67.3 per cent using repeated recycling.

The commercial application of isomerization offers a practical method for the conversion of the relatively cheap normal butane to isobutane in a mildly exothermic[3] catalytic process which operates in the vapor phase at low temperatures. The ultimate conversion of the isobutane to valuable alkylate is most attractive from the point of view of earnings and petroleum refiners are rapidly becoming aware of the commercial possibilities of the isomerization process.

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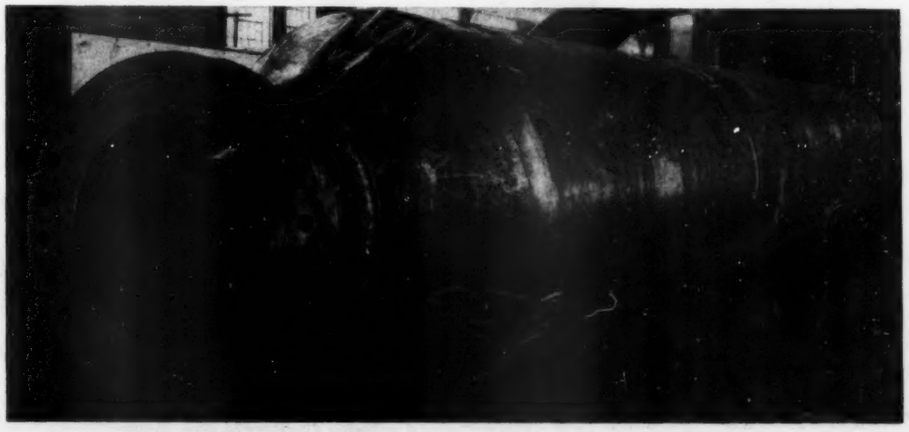
Addition of Graphite to Mineral Oils Cuts Friction Coefficient

The addition of finely divided graphite to mineral oils not only reduces the coefficient of friction of surfaces under vital boundary lubrication conditions, but also changes the character of the surface of the metal according to a report of the National Physical Laboratory in England. Researches of the investigators, A. Fogg, M. Sc., and S. A. Hunwicks, B. Sc., suggested that the adsorption of graphite particles by the surface of the metal results in the formation of a "graphoid" surface.

The lubricating properties of this surface are so pronounced that when the oil carrier was removed by cleaning with benzene, the static coefficient of friction remained unchanged from what it was when the oil was present, a value, of course, far below that of the original metal surface. A conventional mineral oil in which was suspended colloidal graphite was used for the investigations.



One of the three catalyst towers to be a part of an isomerization unit now under construction. Picture taken in the shop to show cone at the base

A Discussion of

Flow Formulas Used for Design Of Gasoline Pipe Lines

By W. E. REA
Engineer, Williams Brothers Corp., Tulsa

W. E. Rea, engineer for Williams Brothers Corp., started in the oil industry on construction and engineering work at the refinery of a Shell subsidiary. In 1926 he went with Phillips Petroleum Co. and was engaged in the design and operation of natural-gasoline plants as assistant to the chief manufacturing engineer. He joined Great Lakes Pipe Line Co. in 1933 as assistant to F. E. Richardson, chief engineer. During his 7 years with the company he developed the formulas presented in the accompanying paper, which were applied in the design of more than 500 miles of lines for the transportation of gasoline and refined products. In July 1940 he joined the staff of Williams Brothers Corp. to handle general engineering and problems connected with the design and construction of various projects.

THE determination of the optimum pipe sizes to be used in a gasoline pipe-line system necessarily includes the consideration of many factors. At the outset the known factors are usually the quantity of gasoline and the distance it is to be moved. With these factors known it becomes apparent that the design of a system hinges on the capacities or rates of flow and the resulting friction loss or pressure drop in given diameter lines.

In making their capacity and friction loss determinations, gasoline pipe-line designers have applied flow formulas in use by two widely separated branches of the pipe-line industry. The first group follow the practice of crude or heavy-oil line designers by applying some form of the Chezy formula, usually as written by Darcy or Fanning, wherein the friction factors or coefficients are based on a dimensional analysis of isothermal fluid flow in pipes. It follows, that engineers using these formulas adhere to sound hydraulic principles. The second group has used a slightly modified form of the Williams and Hazen formula, written to include the density or specific gravity of the gasoline. The W. & H. formula is one of the best known of the empirical "exponential" formulas, and is favorably regarded by hydraulic engineers using it for the flow of water in pipes. The friction factor or coefficient (designated as "C") in this formula was arbitrarily made to agree as closely as possible with Chezy's coefficient.

Generally speaking, it is believed that all of the major gasoline trunk lines, originating in this country within the past decade, were designed by one or the other of these formulas, and further it appears that the application of each to the design of such systems has probably been on a more or less equal basis. In the following it will be shown that the successful application of the W. & H. formula to the design of such systems is made possible by reason of the physical characteristics of the liquid being handled.

Gasoline has a relatively low viscosity when compared with other liquids. Relative to water, which is generally taken as 1.0 centipoise at 68° F., it has values from approximately 0.45 to 0.85 centipoise depending upon its density. This fact, together with the decreasing effect which viscosity has on fluid motion in the turbulent range (which practically always prevails in gasoline pipe lines), accounts for the wide and successful use of the W. & H. formula by this second group of engineers. Empirical or otherwise it gives very satisfactory results when applied by engineers familiar with the design of gasoline pipe lines.

The Darcy Formula

The application of both formulas will be given in the following, together with the results of some observations made of flow phenomena occurring when transporting gasoline by pipe lines over long distances. A formula is derived which represents the mean value of these observations, together with a recommended formula derived from the data of Drew, Koo, and McAdams.

The Chezy formula as written by Darcy is:

$$H = f\frac{L}{D}\frac{v^2}{2g} \qquad (1)$$

H = friction loss, head feet of flowing liquid
f = friction factor or coefficient
L = length of pipe, feet
v = velocity of flow, feet per second
g = acceleration of gravity (32.2 ft. per second per second)
D = inside diameter of pipe, feet

It has been shown by dimensional analysis that Formula (1) can be verified when all of the mechanical quantities entering the situation are included in the analysis. (For a discussion of dimensional analysis as applied to fluid dynamics the reader is referred to the book, "Heat Transmission," by Prof. William H. McAdams.[1]) When applied to (1), dimensional analysis shows that:

$$f = 2g\,\phi\left(\frac{Dv\rho}{\mu}\right) \qquad (2)$$

ρ = density of liquid, pounds per cubic feet
μ = viscosity (English units)

The constant $(2g)$ is usually retained in Formula (1), and (2) is then written

$$f = \phi\left(\frac{Dv\rho}{\mu}\right) \qquad (3)$$

This dimensionless group $(Dv\rho/\mu)$ is universally referred to as the Reynolds number after Osborne Reynolds whose classical researches in the flow of fluids in tubes is well known. Hereafter the argument $(Dv\rho/\mu)$ will be referred to as (R).

Rewriting (1) using conventional pipe-line units gives

$$p = \frac{0.00661\,f\,L\,Q^2\,s}{d^5} \qquad (4)$$

p = friction loss, pounds per square inch per foot of length
f = friction factor
L = length of pipe, feet
Q = rate of flow, barrels (42 gal.) per hour
s = specific gravity, no units
d = inside diameter of pipe, inches

Applying the same units to Equation (3) gives

$$f = \phi\left(2212\,\frac{Qs}{dz}\right) \qquad (5)$$

wherein (z) is the viscosity of the gasoline in centipoises, sometimes referred to as relative viscosity (water = 1.0). Due to the distances involved, pipe-line designers find it advantageous to express pressure drop (p) in units of length greater than the foot. Writing (4) using an increment of 1,000 ft. for (L)

$$P = \frac{6.61\,f\,Q^2\,s}{d^5} \qquad (6)$$

P = friction loss, pounds per square inch per 1,000 ft. = 1,000 p.

We may now write

$$\frac{P\,d^5}{6.61\,Q^2\,s} = \phi\left(2212\,\frac{Qs}{dz}\right) \qquad (7)$$

Equation (7) accounts for all possible mechanical quantities entering the problem except for the variation in roughness of the pipe wall. There is no dimension for roughness; however, it has been shown that (f) is also a function of a second dimensionless group (values to be determined by experiment), and this effect of roughness or "relative roughness" is expressed as (r/d) wherein the roughness (r) is expressed as a length. Generally speaking, this relation has not been used by pipe-line designers, as they prefer to allow for variation in pipe wall roughness by varying the value of the friction factor (f) according to their experience.

It is in the form of Equation (6) that Darcy's formula is generally used by gasoline pipe-line designers. Obviously its successful application depends entirely on the selection of a suitable friction factor (f). Usually the designer must either rely on the published results of various experimenters, or use data of which he has first-hand knowledge. The results of most investigators relative to the value of the friction factor are usually given graphically, where the friction factor (f), the value of the function, is plotted as ordinate against the Reynolds number (R), the variable, as abscissa on double logarithmic coordinates. Fig. 1 is such a graph.

Figure 1

Fig. 1 was made to include only values of the Reynolds numbers likely to be encountered in gas-

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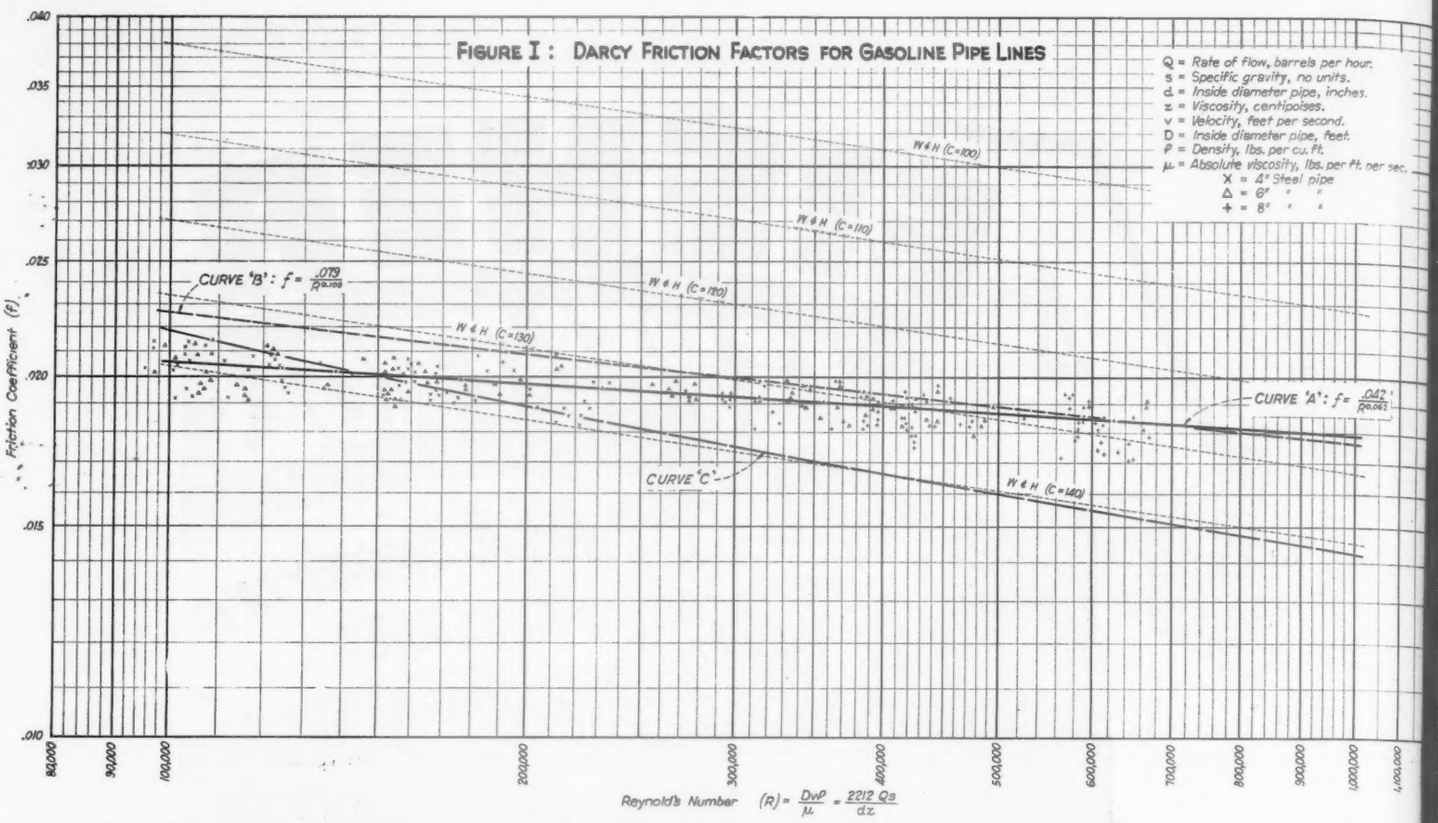


oline pipe-line systems. This range in values is from 80,000 to 1,200,000. Values below about 100,000, gasoline being the liquid flowing, seldom if ever exist in actual practice, which, necessarily means that streamline flow is seldom found to occur in systems of this type. Several curves are plotted on Fig. 1; curve "*A*" represents the writer's data, curve "*B*" is that given by Drew, Koo and McAdams,[3] which, in the writer's opinion, more nearly represents gasoline flow in commercial pipe lines than any other published data. The curves noted *C*-100 to 140 show the approximate relationship between the W. & H. coefficient and the friction factor (*f*). The results of the experiments by Stanton and Pannell while widely used by designers of heavy or crude-oil lines, is not given on Fig. 1 as their values of (*f*), for the higher ranges of Reynolds numbers, are entirely too low to be of much practical value to gasoline pipe-line engineers. Curve "*C*" represents the data of Drew and Genereaux.[3]

Curve "A"

Curve "*A*" gives the results of observations made of day-by-day operation, as well as some tests made of flow phenomena occurring in long-distance gasoline pipe lines. While not approaching laboratory accuracy, curve "*A*" does represent data which was carefully selected, and the degree of accuracy is indicated by the uniformity of the plotted points. No claim is made and it is not to be inferred that the data given is generally representative of flow conditions existing in all pipe-line systems of this type, as it applies specifically to the writer's experience. The range in pipe sizes includes 4, 6, and 8-in. nominal diameter seamless steel A.P.I. line pipe using 40-foot welded lengths. Distances between pumping stations vary from 25 to 100 miles.

Flow occurring in relatively clean lines only was included for determining curve "*A*." The age of pipe is from 1 to 8 years. By a relatively clean line is meant one that equals in performance the best lines existent in systems of this type. This definition may seem vague, but reference to Fig. 1 should indicate the meaning in concrete terms. It must be explained here that such lines exist only as a result of a thorough maintenance schedule intelligently executed. Such maintenance requires the running of pipe-line scrapers at more or less frequent intervals and requires the use of efficient strainers between pumping station sections for the removal of all foreign matter from the line. There is no age limitation included in defining "clean" gasoline pipe lines providing such maintenance is followed and only a reasonable amount of internal corrosion exists.

The gasoline used in plotting the data for curve "*A*" varied from 60° to 80° A.P.I. A few points represent light oils having approximately the same density and viscosity characteristics as the average kerosene.

For purposes of direct comparison with the W. & H. formula, the equations of curves "*A*" and "*B*" were derived. Using the method of averages, the equation for curve "*A*" is found to be:

$$f = \frac{0.042}{R^{0.082}} \qquad (8)$$

This is of the form $f = ax^{-b}$ representing a hyperbolic curve with two constants and gives a straight line when plotted on logarithmic coordinates. The method of averages was used for determining curve "*A*," as it is evident the method of least squares is beyond the accuracy of the data. Writing (8) using the pipe-line units previously given:

$$f = \frac{0.026\, d^{0.082}\, s^{0.082}}{Q^{0.082}\, s^{0.082}} \qquad (9)$$

As stated by Smith,[4] if a fluid without appreciable viscosity flows in a closed conduit, only inertia forces would occur by reason of its movement. These inertia forces would be proportional to the density of the fluid. However, in any real fluid there must necessarily be some effect of viscous forces, The degree to which these viscous forces modify the motion of the fluid depends on their relative magnitude in comparison with the inertia forces. Hence, with fluid flow the significant property of the fluid is not simply its viscosity alone, nor its density alone, but the ratio of viscosity to density, or:

$$\frac{z}{s} = k \qquad (10)$$

Where (*k*) is the kinematic viscosity having the dimensions (F^2/t) and is termed "centistokes." Fig. 2 gives the kinematic viscosities (*k*) of several gasolines as well as their viscosities (*z*) in centipoises. Using kinematic viscosity we may write Equation (9):

$$f = \frac{0.026\, d^{0.082}\, k^{0.082}}{Q^{0.082}} \qquad (11)$$

Equations (8), (9), and (11) gives the value of the function. Substituting (9) for (*f*) in (6) gives:

(Continued on Page 45)

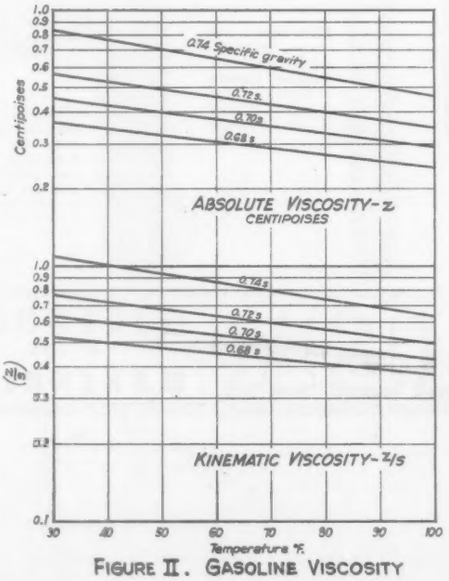
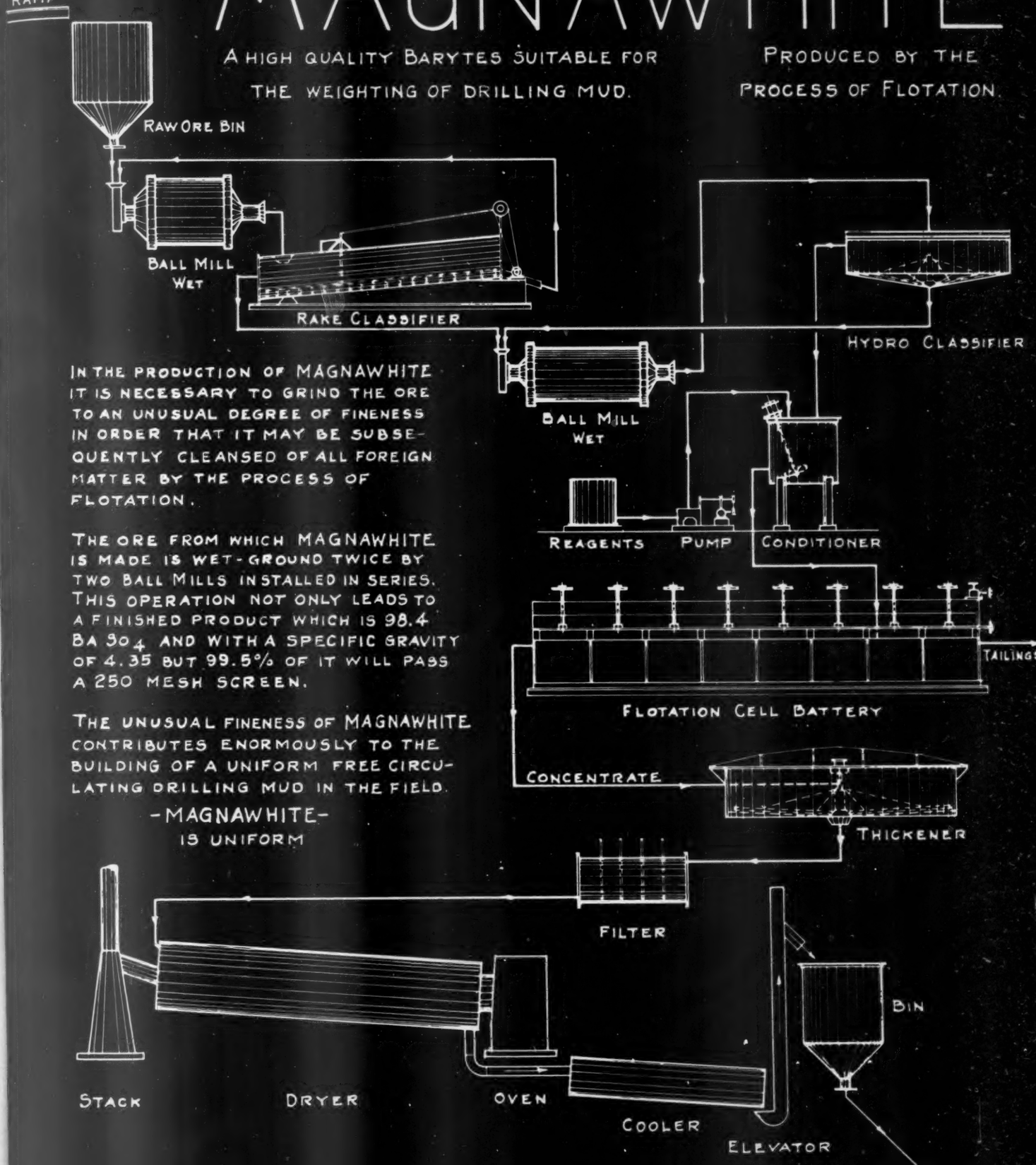


FIGURE II. GASOLINE VISCOSITY

MAGNAWHITE

A HIGH QUALITY BARYTES SUITABLE FOR THE WEIGHTING OF DRILLING MUD.

PRODUCED BY THE PROCESS OF FLOTATION.



IN THE PRODUCTION OF MAGNAWHITE IT IS NECESSARY TO GRIND THE ORE TO AN UNUSUAL DEGREE OF FINENESS IN ORDER THAT IT MAY BE SUBSEQUENTLY CLEANSED OF ALL FOREIGN MATTER BY THE PROCESS OF FLOTATION.

THE ORE FROM WHICH MAGNAWHITE IS MADE IS WET-GROUND TWICE BY TWO BALL MILLS INSTALLED IN SERIES. THIS OPERATION NOT ONLY LEADS TO A FINISHED PRODUCT WHICH IS 98.4 $BaSO_4$ AND WITH A SPECIFIC GRAVITY OF 4.35 BUT 99.5% OF IT WILL PASS A 250 MESH SCREEN.

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WELL LOGS and FIELD DATA . . . . of Active Oil Areas

Southeastern Nebraska

(Compiled by The Oil and Gas Journal)

LOCATION: The area covered by this review includes the northwestern corner of the Forest City basin, the northern end of the buried Nemaha ridge and a portion of the basin on the west side of the ridge.

COMMUNICATIONS: The area is served by a number of railroads including the Burlington, Rock Island, Union Pacific, and Missouri Pacific.

The eastern part of the area is traversed by a number of paved highways converging on Omaha from Topeka, Kans., and Kansas City and St. Joseph, Mo. Several highways leading out of Lincoln are paved although not throughout their entire length.

There are airports at the principal towns surrounding the area.

TOWNS: The leading towns in the area (with population in thousands) are: Lincoln, 80; Beatrice, 10; Nebraska City and Falls City, 7. Omaha, Neb., and St. Joseph, Mo., are within easy driving distance.

SUPPLY HOUSES: Concentration of production near Falls City has made that town the supply center for the area.

DEVELOPMENT: Early development in Kansas extended along a belt in the southeastern part of the state which terminated in Franklin and Miami counties southwest of Kansas City, so far as oil was concerned. An extension of this trend contains shallow gas fields but for many years the northern part of the Forest City basin lying north of this zone was not considered productive.

Following the success of the play in the Illinois basin there was great activity in the Forest City basin and hundreds of thousands of acres were leased, mainly in Missouri. Some activity lapped over into northeastern Kansas and southeastern Nebraska and of all of the wells drilled, it is these two sectors which have yielded the production.

First production was discovered in November 1939 in the second well drilled in Nebraska during the play. Development has continued until there are 28 wells in the field. Meanwhile, two new pools have been found in Nebraska, one about 10 miles west of Falls City and the other a short distance north of the original Falls City pool. All three produce from the Hunton lime.

Encouraging shows have been found in the Viola and several wells have been drilled to that formation, including the original discovery well, but it has not yielded commercial production.

GEOLOGY: The Forest City basin is bounded on the west by the Nemaha ridge, on the northeast by an uplift extending from eastern Missouri into Iowa, and on the south by the Ozark uplift. In the northern part of the basin, Cretaceous rocks, generally known as the Dakota sandstone, overlap the area from the west.

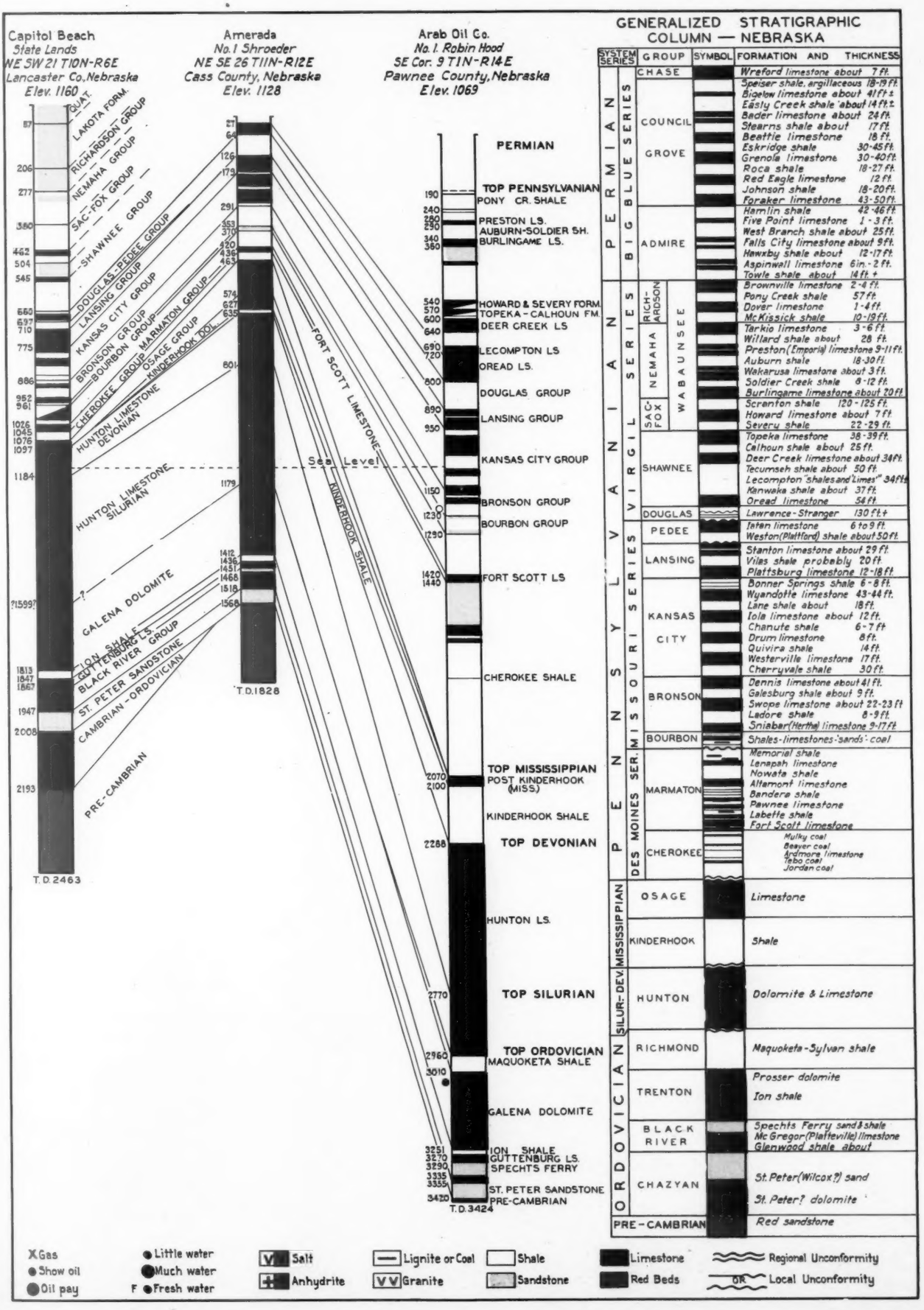
The Nemaha ridge consists of a granite core against and over which were deposited sediments of Paleozoic age. Commencing in eastern Nebraska it becomes increasingly important in southern Kansas and central Oklahoma. On it are located such fields as El Dorado, Edmond, and Oklahoma City. Movements along this arch continued into the Pennsylvanian with the result that its position is reflected in these later sediments.

Movements of the three uplifts surrounding the Forest City basin have resulted in the development of a number of unconformities in the section and also in the formation of many wedge edges and shore-line deposits in the Pennsylvanian strata. These form potential stratigraphic traps.

The reservoirs which have proven commercially productive consist of some of these Pennsylvanian sands in the southwestern part of the basin and the Hunton lime on structures associated with faulting and warping on the east side of the Nemaha uplift.

POSSIBILITIES: Up to the present time, the Pennsylvanian reservoirs have not yielded large quantities of gas and relatively little oil. This is probably due to a considerable degree to the fact that drilling has been largely haphazard and few tests have been located on structure. The lenticular nature of the sands adds to the difficulty of discovery. The low recovery from Pennsylvanian sands is in part to be expected from the fact that the same sands become poorer in oil and gas content in the eastern portions of both Kansas and Oklahoma.

It is, perhaps, significant that the best pay is one which does not produce notable quantities of oil in the district immediately to the south. This leads to the speculation that new pays should be sought rather than those which are known to produce elsewhere. In a new area, there is always a tendency to use names of productive formations in other localities on the assumption that these nearly correlative formations have universally the same properties. This is particularly noticeable in the widespread use of the name "Trenton." Failure to find these formations productive in the new area often leads to premature discouragement. It is entirely probable that other deeper sands and limes will be found in the Forest City basin which will be productive although the same or correlative formations are not elsewhere known to be commercial reservoirs. The upper formations having been found unproductive or, at best, not richly productive, the next step in the Forest City basin is to drill deep, well-located wells in a search for these deeper possible horizons. Up to the present time, the Lower Ordovician and Cambrian formations have hardly been touched, and, outside of southeastern Nebraska, few wells are carried below the Mississippi lime.


Capitol Beach
State Lands
NE SW 21 T10N-R6E
Lancaster Co., Nebraska
Elev. 1160
Amerada
No. 1 Shroeder
NE SE 26 T11N-R12E
Cass County, Nebraska
Elev. 1128
Arab Oil Co.
No. 1 Robin Hood
SE Cor. 9 T1N-R14E
Pawnee County, Nebraska
Elev. 1069
QUAT.
LAKOTA FORM.
RICHARDSON GROUP
NEMAHA GROUP
SAC-FOX GROUP
SHAWNEE GROUP
DOUGLAS-PEDEE GROUP
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OSAGE GROUP
KINDERHOOK DOL.
HUNTON LIMESTONE
DEVONIAN
HUNTON LIMESTONE
SILURIAN
GALENA DOLOMITE
ION SHALE
GUTTENBURG LS.
BLACK RIVER GROUP
ST. PETER SANDSTONE
CAMBRIAN-ORDOVICIAN
PRE-CAMBRIAN
T.D. 2463
T.D. 1828
FORT SCOTT LIMESTONE
KINDERHOOK SHALE
Sea Level
PERMIAN
TOP PENNSYLVANIAN
PONY CR. SHALE
PRESTON LS.
AUBURN-SOLDIER SH.
BURLINGAME LS.
HOWARD & SEVERY FORM.
TOPEKA-CALHOUN FM.
DEER CREEK LS
LECOMPTON LS
OREAD LS.
DOUGLAS GROUP
LANSING GROUP
KANSAS CITY GROUP
BRONSON GROUP
BOURBON GROUP
FORT SCOTT LS
CHEROKEE SHALE
TOP MISSISSIPPIAN
POST KINDERHOOK (MISS.)
KINDERHOOK SHALE
TOP DEVONIAN
HUNTON LS.
TOP SILURIAN
TOP ORDOVICIAN
MAQUOKETA SHALE
GALENA DOLOMITE
ION SHALE
GUTTENBURG LS.
SPECHT'S FERRY
ST. PETER SANDSTONE
PRE-CAMBRIAN
T.D. 3424
GENERALIZED STRATIGRAPHIC COLUMN — NEBRASKA
SYSTEM
SERIES
GROUP
SYMBOL
FORMATION AND THICKNESS
PERMIAN
BIG BLUE SERIES
CHASE
Wreford limestone about 7 ft.
COUNCIL GROVE
Speiser shale, argillaceous 18-19 ft.
Bigelow limestone about 41 ft ±
Easly Creek shale about 14 ft ±
Bader limestone about 24 ft.
Stearns shale about 17 ft.
Beattie limestone 18 ft.
Eskridge shale 30-45 ft.
Grenola limestone 30-40 ft.
Roca shale 18-27 ft.
Red Eagle limestone 12 ft.
Johnson shale 18-20 ft.
Foraker limestone 43-50 ft.
ADMIRE
Hamlin shale 42-46 ft
Five Point limestone 1-3 ft.
West Branch shale about 25 ft.
Falls City limestone about 9 ft.
Hawxby shale about 12-17 ft.
Aspinwall limestone 6 in.-2 ft.
Towle shale about 14 ft +
PENNSYLVANIAN
VIRGIL SERIES
RICHARDSON
Brownville limestone 2-4 ft.
Pony Creek shale 57 ft.
Dover limestone 1-4 ft.
McKissick shale 10-19 ft.
NEMAHA
WABAUNSEE
Tarkio limestone 3-6 ft.
Willard shale about 28 ft.
Preston (Emporia) limestone 9-11 ft.
Auburn shale 18-30 ft.
Wakarusa limestone about 3 ft.
Soldier Creek shale 8-12 ft.
Burlingame limestone about 20 ft.
SAC-FOX
Scranton shale 120-125 ft.
Howard limestone about 7 ft.
Severy shale 22-29 ft.
SHAWNEE
Topeka limestone 38-39 ft.
Calhoun shale about 25 ft.
Deer Creek limestone about 34 ft.
Tecumseh shale about 50 ft.
Lecompton "Shales and Limes" 34 ft ±
Kanwaka shale about 37 ft.
Oread limestone 54 ft.
DOUGLAS
Lawrence-Stranger 130 ft +
MISSOURI SERIES
PEDEE
Iatan limestone 6 to 9 ft.
Weston (Plattford) shale about 50 ft.
LANSING
Stanton limestone about 29 ft.
Vilas shale probably 20 ft.
Plattsburg limestone 12-18 ft.
KANSAS CITY
Bonner Springs shale 6-8 ft.
Wyandotte limestone 43-44 ft.
Lane shale about 18 ft.
Iola limestone about 12 ft.
Chanute shale 6-7 ft
Drum limestone 8 ft.
Quivira shale 14 ft.
Westerville limestone 17 ft.
Cherryvale shale 30 ft.
DES MOINES SER.
BRONSON
Dennis limestone about 41 ft.
Galesburg shale about 9 ft.
Swope limestone about 22-23 ft
Ladore shale 8-9 ft.
Sniabar (Hertha) limestone 9-17 ft
BOURBON
Shales-limestones-sands-coal
MARMATON
Memorial shale
Lenapah limestone
Nowata shale
Altamont limestone
Bandera shale
Pawnee limestone
Labette shale
Fort Scott limestone
CHEROKEE
Mulky coal
Beaver coal
Ardmore limestone
Tebo coal
Jordan coal
MISSISSIPPIAN
OSAGE
Limestone
KINDERHOOK
Shale
SILUR.-DEV.
HUNTON
Dolomite & Limestone
ORDOVICIAN
RICHMOND
Maquoketa-Sylvan shale
TRENTON
Prosser dolomite
Ion shale
BLACK RIVER
Specht's Ferry sand & shale
Mc Gregor (Platteville) limestone
Glenwood shale about
CHAZYAN
St. Peter (Wilcox?) sand
St. Peter? dolomite
PRE-CAMBRIAN
Red sandstone
X Gas
Show oil
Oil pay
Little water
Much water
F Fresh water
Salt
Anhydrite
Lignite or Coal
Granite
Shale
Sandstone
Limestone
Red Beds
Regional Unconformity
OR Local Unconformity

800,000 GALLONS OF FIRST LINE DEFENSE

. . . Safely Stored in API-ASME Code Pressure Tanks Fabricated by

Wyatt's

(Continued from Page 40)

$$\frac{P\,d^5}{6.61\,Q^2\,s} = \frac{0.026\,d^{0.062}\,z^{0.062}}{Q^{0.062}\,s^{0.062}} \qquad (12)$$

$$P = \frac{0.172\,Q^{1.938}\,s^{0.938}\,z^{0.062}}{d^{4.938}} \qquad (13)$$

Formula (13) is the final result of substituting the equation for curve "*A*" in the formula (6).

Curve "B"

Curve "*B*" is that given by Prof. W. H. McAdams in the book, "Heat Transmission" and was also presented in a paper by Drew, Koo, and McAdams at about the same time that the above book was published. It represents the flow of air, brine, steam, and water and is based on the data of some 15 experimenters. The writer has found that it closely represents the flow of gasoline in 4, 6, and 8-in. pipe lines over the range of Reynold's numbers given by Fig. 1. It will be noted that it gives slightly higher values for (*f*) below a Reynolds number of about 600,000 than does curve "*A*."

Curve "*B*" cannot be represented by a straight line on logarithmic coordinates over its entire range. However, between the values of the Reynolds numbers under consideration it closely approximates a straight line, and if we arbitrarily make it straight over this range the error will be insignificant and at the same time makes possible the writing of a relatively simple equation for it; this equation is:

$$f = \frac{0.079}{R^{0.100}} \qquad (14)$$

Substituting pipe-line units as used previously:

$$f = \frac{0.034\,d^{0.100}\,z^{0.100}}{Q^{0.100}\,s^{0.100}} \qquad (15)$$

Substituting (15) for the value of (*f*) in (6) gives:

$$P = \frac{0.226\,Q^{1.891}\,s^{0.891}\,z^{0.109}}{d^{4.891}} \qquad (16)$$

Formula (16) is the flow formula representing curve "*B*" written into Formula (6) and is the formula recommended for gasoline pipe-line flow calculations between Reynolds numbers of 80,000 and 1,200,000.

Curve "C"

The widely used data of Drew and Genereaux is given on Fig. 1 as curve "*C*" and it will be seen that it gives considerably lower values for the friction factor (*f*) than either curves "*A*" or "*B*" for the higher values of (*R*). In fact for the range of about 250,000 to 1,000,000 (*R*) it practically coincides with the W. & H. line for a "*C*" of 140. A study of flow conditions existing in long-distance gasoline lines reveals that such values are unusually low; that is low Darcy (*f*) and high W. & H. (*C*). For this reason the Drew and Genereaux curve or equation, according to the writer's experience, does not apply to such lines with an accuracy equivalent to curves "*A*" and "*B*." This statement applies not only to the low values of the coefficient but to the slope of the curve as well, the significance of which will be understood on considering flow problems where all conditions remain constant, except for one factor. As an example, the resulting effect on the pressure drop when the rate of flow of a given fluid is increased or decreased, in a given line.

It is the writer's understanding that the lower values of the friction factor given by the Drew and Genereaux equation (curve "*C*"), when compared to the earlier data of Drew, Koo, and McAdams, resulted primarily from the inclusion of data covering the flow of water and natural gas in large-diameter lines.[5] While their work represents the latest available data and covers flow phenomena of the greatest variation, it is believed that the curve of Drew, Koo, and McAdams (curve "*B*," Formula 16) will be found more satisfactory when applied to gasoline pipe-line problems. The formula for curve "*C*," wherein (*F*) is the Fanning coefficient having a numerical value of one-fourth of the Darcy (*f*); i.e., $f = 4F$:

$$\frac{1}{\sqrt{F}} = 3.2\log(R\sqrt{F}) + 1.2$$

In order to eliminate the trial and error procedure when predicting the capacity of a given pipe line with a fixed pressure drop, Drew and Genereaux, plotted the relation $(\rho v/x)$ vs. (Dx/μ) where the dimensional term (x) having the units of lb./(sec.) (sq. ft.) is given by:

$$x = (2\,g_c\,D\rho^3\,dF/dN)^{0.5}$$

Where (*F*) is the friction loss, ft.-lb./lb., (*N*) is the length, ft., (ρ) density, lb./cu. ft., (*D*) is diameter, ft., (g_c) is 32.2 mass lb. × ft./(sec.^{2}) (force lb.). From the nature of the problem all factors are known except the dimensional term (x) which can be calculated. When this is done the calculated value is substituted in the above groups and the velocity (v) determined from the graph of $(\rho v/x)$ vs. (Dx/μ). Knowing the velocity the rate of flow may be expressed in any units desired.

The Williams and Hazen Formula

The W. & H. formula as written by the authors[6] is not readily applicable to the flow of gasoline in pipes. It has been modified by gasoline pipe-line designers to include the specific gravity or density of the gasoline. In the original form it was written:

$$v = 1.318\,C\,r^{0.63}\,i^{0.54} \qquad (17)$$

v = velocity of flow, feet per second
C = friction coefficient (Chezy formula)
r = mean hydraulic radius = $(D/4)$
D = diameter of pipe, feet
i = hydraulic gradient or slope = (h/l)

Modified to include the specific gravity of the gasoline and expressing the friction loss as pounds per square inch per 1,000 ft. of line, it is written:

$$P = \frac{2324\,Q^{1.85}\,s}{C^{1.85}\,d^{4.87}} \qquad (18)$$

The W. & H. formula includes all of the mechanical quantities included in (13) and (16) except the viscosity of the gasoline, or in other words the exponent of viscosity is zero in this formula.

The coefficient "*C*" in the W. & H. formula, usually obtained in clean gasoline lines varies in value from approximately 125 to 140. Good average values for 4, 6, and 8-in. nominal diameter lines seem to be 140, 135, and 130, respectively. This is contrary to most published data, which shows an increase in "*C*" with pipe diameter. Professor Durand states,[7] "A suitable analysis of the W. & H. formula serves to show that starting with standard conditions of hydraulic radius and a standard value of hydraulic slope the value of "*C*" varies as the eighth root of the hydraulic radius and the twenty-fifth root of the hydraulic gradient." In any event the records of several gasoline pipe-line systems indicate a decrease in "*C*" with an increase in pipe diameter, approximately in the order as given above.

Viscosity

It can be shown that if gasoline densities, and hence their viscosities, vary only slightly, that is, if the grades of gasoline being pumped have approximately the same specifications, the practical effect of omitting viscosity from the flow calculations is of small magnitude. If, however, there is considerable variation in density, the W. & H. formula will be found to give high values of "*C*" for low specific-gravity gasolines and low values of "*C*" for high specific-gravity gasolines. This variation of the friction coefficient in the W. & H. formula with the liquid flowing becomes considerable when the lighter oils such as, light furnace oils, distillates, and kerosenes are pumped in addition to regular gasolines through the same lines. To cope with this variation it becomes necessary when making capacity and friction-loss determinations to use values for the W. & H. coefficient that will agree with the product being pumped. This procedure of adjusting the friction coefficient with the fluid flowing is confusing, for it is evident the roughness of the pipe walls does not change with the liquid flowing. Also the importance of using gasoline of the same density when determining the condition of pipe lines in terms of the W. & H. coefficient will be understood.

The effect of viscosity and density on friction loss and rate of flow as given by each of the formulas becomes apparent if one assumes that in a given line, with all other conditions constant, the product flowing in the first case is a 0.74 sp. gr. gasoline having a viscosity of 0.65 centipoise and in the second case is a 0.80 sp. gr. kerosene with a viscosity of 2.0 centipoises. The subscript (1) refers to the gasoline and (2) to the kerosene.

$s_1 = 0.74$ $\quad$ $s_2 = 0.80$
$z_1 = 0.65$ $\quad$ $z_2 = 2.0$

By Formula (13):

$$\frac{P_1}{P_2} = \left(\frac{0.74}{0.80}\right)^{0.938}\left(\frac{0.65}{2.0}\right)^{0.062}$$

$$P_2 = 1.15\,P_1$$

$$\frac{Q_1}{Q_2} = \left(\frac{0.80}{0.74}\right)^{0.531}\left(\frac{2.0}{0.65}\right)^{0.062}$$

$$Q_2 = 0.93\,Q_1$$

By Formula (16):

$$\frac{P_1}{P_2} = \left(\frac{0.74}{0.80}\right)^{0.891}\left(\frac{0.65}{2.0}\right)^{0.109}$$

$$P_2 = 1.21\,P_1$$

$$\frac{Q_1}{Q_2} = \left(\frac{0.80}{0.74}\right)^{0.471}\left(\frac{2.0}{0.65}\right)^{0.109}$$

$$Q_2 = 0.91\,Q_1$$

By W. & H. Formula (18):

$$P_2 = 1.11\,P_1$$
$$Q_2 = 0.95\,Q_1$$

Thus, in changing from gasoline to kerosene, with all other conditions constant, Formula (13) shows the friction loss increases 15 per cent, or the rate of flow decreases 7 per cent for the same friction loss; by Formula (16) the friction loss increases 21 per cent or the rate of flow decreases 9 per cent. The W. & H. Formula (18) indicates an increase in the friction loss of only 11 per cent and a rate of flow decrease of only 5 per cent. Thus, if (13) or (16) give approximately correct results it is seen that the W. & H. coefficient must necessarily decrease if it is to give comparable results. As previously stated, this is what happens.

Temperature

The change in viscosity and density of a given gasoline due to reasonable temperature changes has a very small effect on either the friction loss or rate of flow. To illustrate, assume a 0.72 sp. gr. gasoline at a flowing temperature of 60° F. as a summer condition and the same gasoline flowing at a winter temperature of 40° F. By Formula (16) the friction loss varies directly as the viscosity to the 0.109 power and the specific gravity to the 0.891 power. The rate of flow varies inversely as the viscosity to the 0.062 power and the specific gravity to the 0.471 power. The subscript (1) refers to the first or summer condition and (2) to the second or winter condition.

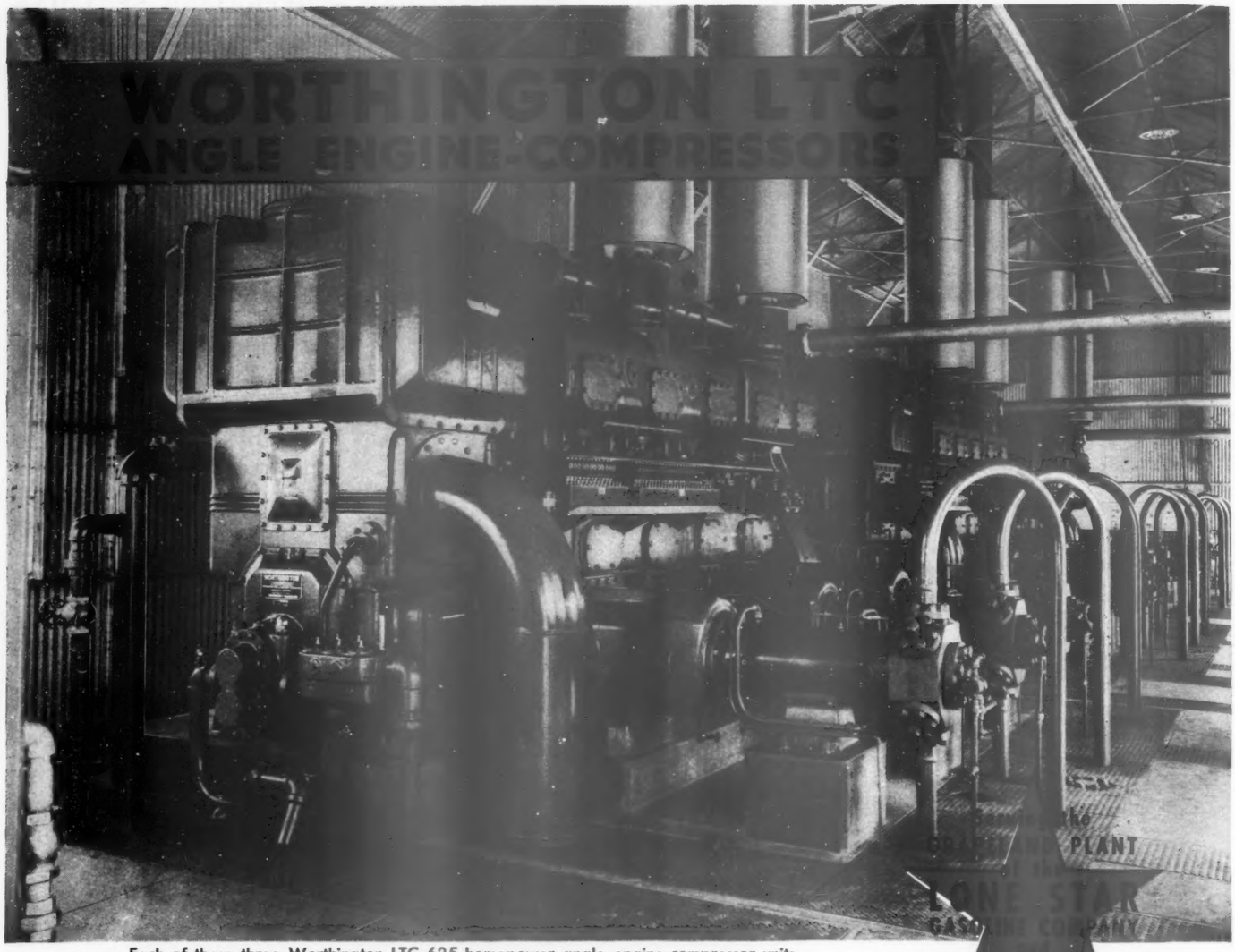
$$P_2 = P_1\left(\frac{0.53}{0.46}\right)^{0.109}\left(\frac{0.73}{0.72}\right)^{0.891}$$

$$= 1.028\,P_1$$

$$Q_2 = Q_1\left(\frac{0.46}{0.53}\right)^{0.062}\left(\frac{0.72}{0.73}\right)^{0.471}$$

$$= 0.986\,Q_1$$

With other conditions constant the friction loss



Each of these three Worthington LTC 625 horsepower angle engine-compressor units has a capacity of approximately 20 million cubic feet of gas per day. Suction pressure is maintained at 1700 p.s.i. and discharge pressure at about 2700 p.s.i.

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ENGINE-COMPRESSORS
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HEAVY CONSTRUCTION
STRAIGHT LINE DESIGN
SINGLE SCAVENGING AIR PUMP
REPLACEABLE CYLINDER LINERS
CONE TYPE CYLINDER HEADS
CAST-IN LUBE OIL DUCTS

GCO-6

THESE repressuring compressors were placed in operation in June 1940. They exemplify the most advanced developments in rational angle engine-compressor engineering for continuous full load service. From the start they have given excellent performance and over-capacity. Straight line design provides maximum accessibility and smooth power flow. Heavy construction throughout assures strength, rigidity and maintained alignment, with resulting low cost and trouble-free operation.

•

Worthington LTC units are built in six sizes—

375 ... 500 ... 625 ... 750 ... 875 ... 1000

brake horse power

COMPRESSOR CYLINDERS are available in a wide selection of designs. Cast iron, cast steel or steel forgings are used as pressure conditions may require.

WORTHINGTON EXPERIENCE of more than 40 years in building over six hundred compressors for pressures of 2000 to 5000 p.s.i., provides a background which assures to their users maximum dependability and efficiency.

WORTHINGTON

WORTHINGTON PUMP AND MACHINERY CORPORATION GENERAL OFFICES: HARRISON, NEW JERSEY

increases 2.8 per cent, or with the same friction loss the rate of flow decreases 1.4 per cent. Thus it is seen that seasonal temperature variations has little effect on line capacities when gasoline is the liquid flowing.

Application

Formula (6) together with curves such as those given on Fig. 1 are the basic data with which pressure-drop predictions are made by designers using the "rational" method. It will be noted, however, that when quantity or rate of flow is desired for a given pressure drop in a given line, the application of such curves involve a trial and error procedure that makes their use unattractive. It was to eliminate this trial and error procedure that the relationship ($\rho v/x$) vs. (Dx/μ) was plotted by Drew and Genereaux.

Formula (16) is recommended generally to the designers of gasoline and light-oil lines. While the writer believes that Formula (13) closely represents the flow of gasoline and light oils in pipe lines of the sizes given, the data is largely based on conditions existing in one system only. While not appearing on Fig. 1, both (13) and (16) have been checked against the flow of kerosene and distillates in 6-in. and 8-in. diameter lines where the Reynolds numbers were between 60,000 and 70,000 with very close results. The differences were even smaller in these ranges than for higher values of (R).

There has been no attempt on the writer's part to discourage the use of the Williams and Hazen formula. For, as has been pointed out, its application to gasoline-flow problems gives very satisfactory results. Its use presents difficulties only when products having considerable differences in density and viscosity are moved through the same pipe line. It should be pointed out here that the various "C" curves appearing on Fig. 1 are necessarily only approximate as the viscosity value for each of them was assumed at unity.

The solution of "exponential" equations involves a more or less laborious procedure with a table of logarithms. These lengthy calculations can be avoided by the preparation of suitable charts, either plotted on logarithmic paper or nomographic. There is a slide rule available for the solution of the W. & H. formula as given by (18) which greatly simplifies flow calculations by its use.[8]

Example

The following example will indicate the results obtained by applying the different formulas to a problem: Determine the friction loss in a 6.107-in. i.d. line 300,000 ft. in length (initial and terminal elevations the same) through which is flowing 500 bbl. per hour of 65° A.P.I. gasoline having a viscosity of 0.46 centipoise at an average flowing temperature of 60° F.

Formula (13):

$$P = 2.70$$
$$300 \times 2.70 = 810.0 \text{ lb./sq. in. for } 300{,}000 \text{ ft.}$$

Formula (16):

$$P = 2.82$$
$$300 \times 2.82 = 846.0 \text{ lb./sq. in. for } 300{,}000 \text{ ft.}$$

W. & H. Formula (18) when "C" is 135:

$$P = 2.82$$
$$300 \times 2.82 = 846.0 \text{ lb./sq. in. for } 300{,}000 \text{ ft.}$$

Formula (6) using curve (C) Drew and Genereaux:

$$P = 2.45$$
$$300 \times 2.45 = 735.0 \text{ lb./sq. in. for } 300{,}000 \text{ ft.}$$

Looping Formulas

One means of increasing the capacities of existing gasoline pipe-line systems is by the addition of a parallel line of such size and length that it will give the desired increase in capacity. While such lines, or "loops," as they are generally called, have not been used as extensively in gasoline pipe-line systems as in the crude-oil systems (due to the contamination between grades of gasolines resulting therein), there are quite a number of them in use.

The method generally used to determine the required length of a loop line is to convert an arrangement of parallel lines to an equivalent length line of any chosen diameter, having the capacity desired at given initial and terminal pressures. The following formulas give the length of a single line equivalent to the length of any combination of parallel lines. These formulas are given for use with Formulas (13), (16), and the W. & H. Formula (18). The following nomenclature will be used:

Q_o = original rate of flow, barrels per hour
Q_x = barrels per hour, through equivalent length line
$Q_1, Q_2 \ldots Q_n$ = barrels per hour, through individual parallel lines
$L_o, L_1 \ldots L_n$ = length of individual parallel lines
L_x = length of equivalent line
$P_o, P_1 \ldots P_n$ = pressure drop, pounds per square inch per 1,000 ft. of individual lines
P_x = pressure drop, pounds per square inch per 1,000 ft. of equivalent line
d_x = diameter in inches of equivalent line
$d_1, d_2 \ldots d_n$ = diameter in inches of parallel lines

For all three formulas, according to the conditions of the problem we can write:

$$Q_o = Q_x = Q_1 + Q_2 + \ldots Q_n \quad (19)$$

$$L_o = L_1 = L_2 = \ldots L_n \quad (20)$$

$$P_o = P_1 = P_2 = \ldots P_n \quad (21)$$

$$P_o L_o = P_x L_x = P_1 L_1 = P_2 L_2 = \ldots P_n L_n \quad (22)$$

Rearranging (13) to solve for Q and substituting in (19) gives:

$$\frac{P_x^{0.536}\, d_x^{2.548}}{0.403\, z_x^{0.032}\, s_x^{0.484}} = \frac{P_1^{0.536}\, d_1^{2.548}}{0.403\, z_1^{0.032}\, s_1^{0.484}} + \ldots \frac{P_x^{0.536}\, d_x^{2.548}}{0.403\, z_n^{0.032}\, s_n^{0.484}} \quad (23)$$

But from 22:

$$P_x = \frac{P_o L_o}{L_x} \quad (24)$$

Substituting the value of P_x as given by (24) and (23) and canceling equals gives:

$$L_x = \frac{L_o\, d_x^{4.908}}{(d_1^{2.548} + d_2^{2.548} + d_n^{2.548})^{1.858}} \quad (25)$$

which is the equivalent length of a line, with all other conditions constant, equal to the capacity of the parallel lines, using Formula (13) as the basis.

In the same manner, but without going through the algebraic procedure, the equivalent length formulas for (16) and (18) are:

For Formula (16):

$$L_x = \frac{L_o\, d_x^{4.901}}{(d_1^{2.588} + d_2^{2.588} + d_n^{2.588})^{1.901}} \quad (26)$$

For the W. & H. Formula (18):

$$L_x = \frac{L_o\, d_x^{4.87}}{(d_1^{2.63} + d_2^{2.63} + d_n^{2.63})^{1.85}} \quad (27)$$

Conclusion

Curve "A" on Fig. 1 was given primarily to show the general trend established, in one system, for the flow of gasolines and light oils in the sizes of pipe shown. The derivation of Formula (13) was made by the writer several years ago and the formula used with consistently good results ever since. Even so, it cannot be recommended generally, due to its more or less limited scope. The close agreement between it and the data of Drew, Koo and McAdams (curve B) indicates that their curve does closely represent actual flow in gasoline lines, for the range considered, and therefore can be used with confidence for similar conditions.

As written, Formulas (13) and (16) contain no friction factor or coefficient such as the Williams and Hazen coefficient (C). To some this will prove a distinct inconvenience. The writer has in mind a practice employed by at least two major gasoline-line operators, who plot current W. & H. coefficients graphically for all sections of their lines, in order to determine the internal condition of these lines. As lines become fouled, the extent of such fouling is reflected by the friction coefficient, which indicates the need for line-cleaning operations such as running scrapers.

While not strictly rational, an arbitrary roughness or fouling factor could be written into the numerators of Formulas (13) and (16). Such a factor would serve the same purpose as that mentioned above, and it could also be varied at will, for designing purposes.

By using formulas which take into account the physical properties of the liquid flowing, the variation of coefficients (due to liquid characteristics), such as the W. & H. (C), is eliminated. However, variations in pipe-wall roughness are not readily accounted for unless some form of coefficient is used to indicate, at least, relative values of roughness. Finally, the determination of such physical properties as gasoline viscosities offers a handicap to the user of a so-called rational formula. It will be found that few, if any, gasoline pipe-line operators have equipment for making such tests, hence viscosities are usually eliminated.

The pipe-line engineer will continue to employ those methods of design which permit him to consistently predict line performance with the greatest possible accuracy, as long as such methods are within the realm of practicability. Certainly, the successful design of long-distance gasoline or oil lines is not possible, merely by applying a formula, be it "rational" or otherwise.

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BOOK REVIEW

THE RING INDEX, by A. M. Patterson and L. T. Capell. Price $8.*

"The Ring Index," a 662-page, well-bound book compiled by a board of editors of the American Chemical Society should find a place in the library of every refining company which undertakes fundamental, organic chemical research. A product of many years of investigation the contents of the book reflect the need as expressed in 1919 for an authoritative tabulation of symbols and structural formulas of ring compounds. The work was undertaken by the society at that time as part of its program of publishing scientific and technologic monographs, of which series this book is offered as No. 84.

The book includes all known parent ring systems arranged in order from the simplest to the most complex and if one is interested in a particular member of any system, he can identify it by means of the alphabetically arranged list of hydrocarbons in each system. Identification of the source of the information on each hydrocarbon is included.

The book will permit standardization of formula-designations and will permit a researcher to more quickly recognize the hydrocarbon and also to visualize its synthesis and reactions.

*"The Ring Index" may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $8, postage prepaid (extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment is not provided, the book will be sent c.o.d. to avoid delay.

Left: Drilling two wells at a time in a vertical shaft lined with concrete. The rod-puller is moving tools out of one hole and into one on the opposite side of the shaft, at the rate of 100 ft. per minute. Right: Six wells drilled horizontally into the oil pay flow by gravity to the bottom of the vertical shaft

Drilling Horizontal Wells From a Vertical Shaft

By LEO RANNEY
McConnelsville, Ohio*

IN the extraction of fluids from the earth, the larger the exposed productive area the more copious will be the flow. It makes no difference whether the fluid be oil, water or gas. From time immemorial the common practice has been to recover fluids by drilling vertical wells into or through the productive horizon. Thereby the exposure of the producing formation is limited in length to the thickness of the bed.

Oil wells are often drilled 5,000 ft. deep to penetrate 50 ft. of productive sand—so 99 per cent of such a well is a total loss, in so far as production is concerned. In water wells the percentage of useless hole is much smaller, because the wells are shallower, but due to a short radius of influence, high velocities of inflow, encrustation and sanding up, vertical water wells leave much to be desired.

If it is at all possible, why not drill wells that are 100 per cent productive, instead of 1 per cent? Then to recover oil, why not drill horizontal wells instead of vertical ones? Twenty-five years have gone into the working out of this problem—and horizontal drilling is an accomplished fact. In the development of the method, some 7,500 ft. of horizontal wells have been drilled in rock.

First Horizontal Oil Well

The first horizontal well was drilled into an old outcrop of the first Cow Run sandstone in Morgan County, Ohio.† This well was 2⅝ in. in diameter and had two branches, one to 802 ft. and the other to 953 ft. The hole was turned up or down at will, and was never out of control. Not a single whipstock was used. At 802 ft. in depth, the shorter branch of the well was 3 in. above the mouth. The other branch was turned into another substratum, then kept level to the end.

Saturation of the sand averaged less than 15 per cent, and authorities on the subject, who analyzed the cores, reported that because of low saturation, no oil could be recovered by conventional methods in use. Yet, after the well was shot, when it had been on production for 6 weeks, daily recovery of oil was at a rate greater than the combined rate of the 50 nearest producing vertical wells in the field. The oil flowed from the formation to the well head by gravity.

After this encouragement, a concrete-lined shaft was sunk, 800 ft. back from the first well, and 200 ft. from another outcrop. A working floor was built 8 ft. above the concrete bottom, and an enclosed tank was lowered into the sump, this tank to receive oil produced with the drill water. An electrically operated, specially built diamond drilling machine was placed on the floor in the center of the work chamber.

Wells Drilled in Pairs

The wells from the work chamber at the bottom of the shaft were drilled in diametrically opposite pairs, the mouth of each well being 1 ft. above the bottom of the sand. A new development that we call a "rod puller" was placed at the mouth of each well during the drilling operation, to run the tools in and out. When 30 to 50 ft. of core had been cut in one direction, another core barrel and bit were placed in the mouth of the opposite well and the rear end of the drill rods connected thereto.

So, when a barrelful of core was being pulled from one well, the drill rods and the other set of tools were being run into the opposite well, by the same operation. New 10-ft. lengths of drill rod were added as the holes were deepened, but the drill rods were not disconnected until both wells were completed. Thereby, drilling time was reduced by 75 to 90 per cent. The "rod pullers" moved the tools out of one hole and into the opposite one at the rate of 100 ft. per minute. Three pairs of holes were thus drilled, half of them to property lines, averaging just under 1,000 ft. in length.

To the south the oil sand was flat, so the holes in that direction were level. But to the north the bottom of the oil sand was wavy, so the wells in that direction were turned up and down to follow the undulations of the formation. With the special tools used, about 10 minutes was required to turn the hole up or down at any desired angle—without the use of whipstocks. A new type of surveying instrument was developed, integral with the core barrel. With this instrument, when a core is pulled a survey of the hole is automatically taken, accurate to $\frac{1}{8}$ in. per 10 ft.

Casing Program

Each horizontal well is cased with only 100 ft. of 3½-in. pipe, grouted in. No other casing or tubing is required in a rock well. A tee on the end of each casing has one end pointed upward to receive vacuum or pressure. The bottom end of the tee of each producing well is connected to the flow line, which is a header leading to the common pump that pumps all liquid to the tanks aboveground. Oil and water flow from the wells to this pump by gravity.

As yet, none of the wells from the shaft bottom have been shot. Preparation is being made to shoot wells No. 1 and No. 5 for a length of 800 ft. each with a shot 2½ in. in diameter. Well No. 3 (which is between these two) will be shot only for 300 ft. (at first) at the far end. A pressure medium of hot gas will be injected into the middle wells under a pressure of 30 lb. per sq. in.

Since horizontal wells may be surveyed and controlled at a length of 1,000 ft. as easily as at 100 ft., there seems to be no reason why holes may not be drilled 3,500 ft. long. In other words, 800 acres of ground might be worked from one shaft. In drilling the six wells mentioned above there were no fishing jobs. The drilling of horizontal wells is not difficult, once the technique is understood and the prescribed tools are in hand. . . . (The author then discussed horizontal gas wells, horizontal water wells and recharging water through horizontal wells.)

*Portion of a paper read before a meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers held in Los Angeles, Calif., Jan. 10, 1941, under the author's title of "Horizontal Wells." Mr. Ranney's present address is at Morro Bay, Calif.

†Described by Mr. Ranney in the Apr. 20, 1939, issue of The Oil and Gas Journal, p. 68.

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Rotation of Casing While Cementing

By HARRY F. SIMONS

CEMENTING of casing in rotary holes has been the practice for a number of years, the purpose being to provide a support and a protective sheath for the steel pipe and to seal off any water which might be above the producing horizon or the casing point. Cement jobs were often found to be unsatisfactory because of the uneven distribution of cement behind the pipe and recent efforts have been directed toward insuring the necessary uniformity.

Principal troubles were due to failure to center the casing in the hole and channeling of cement on one side of the pipe regardless of whether the pipe was centered or not. This leaves the pipe protected in some sections and open to the action of corrosive ground water in others with eventual failure resulting. The unprotected casing also presented a hazard in shooting as the vibrations set up following the discharge of the nitroglycerin might concentrate at a weak spot in the pipe and rupture it.

Some companies several years ago introduced the practice of running temperature surveys to determine the height of the cement behind the pipe. These were run shortly after the cement had been placed and before it had completely set. The top of the cement was located by a sharp temperature rise of the fluid inside the pipe. It was often found however, that a temperature rise would be noted some distance above the actual top of the cement, indicating the presence of a stringer of cement behind the pipe. The true level of the cement would then be found by a slightly larger temperature increase.

A more recent method of locating the top of the cement depends on the inclusion of a radioactive material in the slurry and then using a gamma ray logging device which will indicate immediately when the electrode is opposite a cemented section. The principal advantage of this method is that it can be run at any time after the well has been completed and does not need to be run while the cement is setting. In several wells in the Cumberland field of Oklahoma, Carnotite has been added to the cement.* The practice is to add 1 lb. of Carnotite to each of the first 25 sacks of cement pumped into the well.

Plastic Flow Utilized

The plastic flow of the slurry is now being used to insure uniform placement of the cement on wells being drilled by the Pure Oil Co. in the Cumberland field, in Marshall and Bryan counties, Oklahoma. When displacement of the cement is started, rotation of the casing is commenced and continued until the cement has been put in place. Due to the friction between the pipe and slurry the latter is forced to travel in a spiral around the casing as it moves up the hole. This method has been used successfully by several Gulf Coast operators on wells about 8,000 ft. deep but has only recently been introduced in the Mid-Continent. Little additional equipment is necessary to rotate the casing while cementing and much of it is generally to be found on every drilling rig or can be easily made from tools at hand.

Pay string of casing in the Cumberland field is generally set at approximately 5,000 ft. in the Bromide sand, although several strings have been set at depths several hundred feet shallower. Casing pattern includes about 830 ft. of 10¾-in. o.d. casing cemented in a 15-in. hole, and 4,800 ft. of 7-in. o.d. casing cemented with 300 sacks of cement in a 9 or 8¾-in. hole. Careful supervision of the mud is necessary throughout the drilling of the hole to prevent blowouts and sticking of the pipe and special care is taken during coring and preparatory to cementing; a weight of 10.9 lb. per gal. and a viscosity of 38 seconds A.P.I. is generally maintained.

In most wells two grades of pipe have been used in the pay string, 1,500 ft. of C-45 and 3,500 ft. of D-55. This provides greater tensile strength and resistance to collapse when it is needed. Weight of the pipe is 26 lb. per ft. Care is taken to see each joint is property made up.

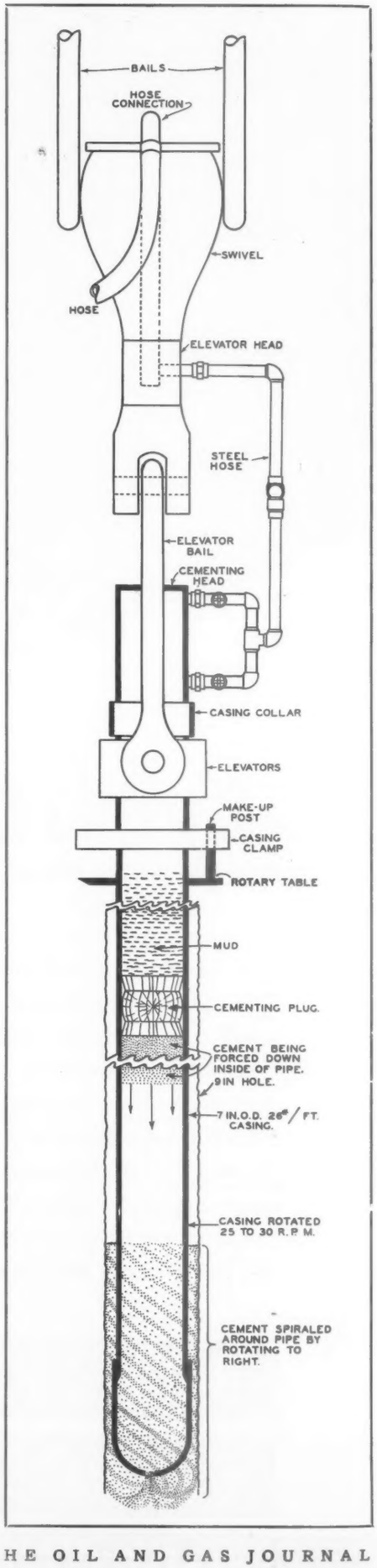
After the casing has reached bottom and circulation established. rotation of the casing is started. The cement is mixed and pumped into the pipe with the weight of the slurry kept between 15.6 and 15.7 lb. per gal. As soon as the cement has been pumped into the pipe, the regular plug is placed in casing and displacement begun with mud, a weighted measuring line following the plug to check its position and the position of the cement. Rotation of the casing is maintained to insure the even distribution of the cement.

Rotate at 25-30 R.p.m.

From 25 to 30 r.p.m. of the casing has been used in the Cumberland field during the time the cement was being displaced. The time required for this is generally about 15 minutes, although the time varies depending on the fluid capacity of the pump and the horsepower of the driving end. The 300 sacks of cement in a 15.7-lb.-per-gal. mixture make 2,604 gal. of slurry. This amount of cement will occupy 2,064 ft. of annular space between 7-in. casing and a 9-in. hole.

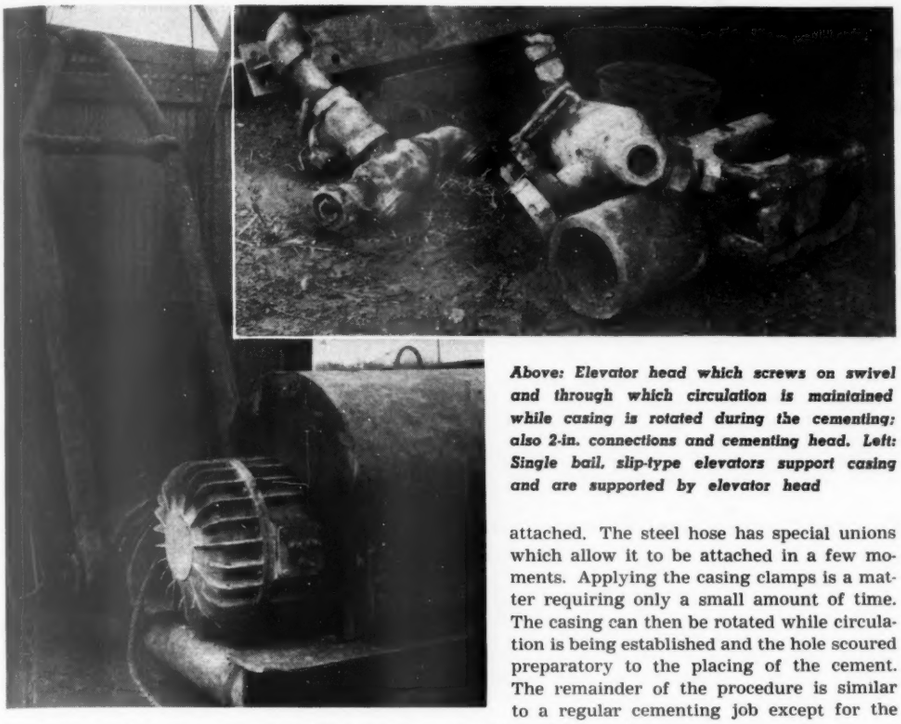
The speed of rotation is very mild when compared to rotating speeds of drill pipe but it is purposely kept low to prevert damage to the thread connection at the joints. Care is taken to avoid shocks when starting and stopping rotation as the joints could be loosened if the casing were handled too roughly and backlash allowed to develop. Despite the fact that the casing is suspended freely in the hole, the power required to turn the pipe is considerable due to the viscosity of the cement.

There are two methods by which the casing may be rotated while cementing, one by hanging the casing in the rotary table and the other by suspending it from the swivel. Pure Oil Co. uses



Schematic drawing showing effect of rotation of casing while cementing and equipment used with this method

*Lynn G. Howell and Alex Frosch, "Detection of Radioactive Cement in Cased Wells," Petroleum Dev. and Tech., 1940.



Above: Elevator head which screws on swivel and through which circulation is maintained while casing is rotated during the cementing; also 2-in. connections and cementing head. Left: Single bail, slip-type elevators support casing and are supported by elevator head

the latter method as it permits raising and lowering of the pipe while cementing.

The tool used for supporting the casing while rotating has a tool-joint box for screwing on to the swivel on one end and a becket and pin which is placed through the single bail elevators. It has no name although some call it a "circulating hook." The tool-joint box has an A.P.I. left-hand thread to match the pin on the swivel. This special tool has a 2-in. connection to which a flexible steel hose is attached for conducting the mud and cement from the swivel to the regular cementing head. Elevator bails, hose and casing all rotate together.

Slip-Type Elevators Used

Elevators used are of the slip type so there is no danger of backing off the top collar on the casing. Double-bail elevators could be used but they would require a modified circulating hook between the swivel and elevators. A regular cementing head is employed. This has a bypass on it which allows the cement to enter the casing below the wooden plug and by operating two valves switches the pressure to behind the plug. While the cementing head has a stuffing box in the top for a measuring line, it is not used at Cumberland as the cementing plug is bumped against the float. The float collar is run one joint off bottom.

The drive between the rotary table and casing is accomplished by placing casing clamps on the pipe and sticking a makeup post in the rotary table. Practically all rotary tables have holes for makeup and breakout posts with a piston rod from a duplex pump being most commonly used for this purpose. On more recent jobs the slips have been set in the rotary table and a small amount of weight allowed to be supported by them.

The casing in most of the wells in the field has been suspended in the hole and does not rest on a seat. If a seat were used, the pipe could easily be held a foot or two off bottom and at the conclusion of the cement displacement, lowered to its final resting place.

The changes in procedure from a regular cementing job are very few. The special circulating hook is screwed on the swivel and the elevators attached. The steel hose has special unions which allow it to be attached in a few moments. Applying the casing clamps is a matter requiring only a small amount of time. The casing can then be rotated while circulation is being established and the hole scoured preparatory to the placing of the cement. The remainder of the procedure is similar to a regular cementing job except for the rotation of the casing.

Due to caves in many wells the cement will often not occupy the vertical distance in the annular space which the calculations would indicate as an enlargement of only a few inches will greatly affect the amount of cement required per lineal foot. If more vertical space is occupied by the cement than calculations show should be filled, it is an indication of channeling of the cement. This often happens in regular-type cementing jobs. Temperature surveys run at Cumberland indicate there are some caves in the lower portion of the hole as the cement has failed to rise to the expected height. The temperature surveys have never shown that there is any indication of channeling on wells which rotated the casing while cementing.

●

Questions and Answers

I wish to recondition a 1,025-ft. well which now has a string of 10-in. surface casing in it. I'd like to set 100 ft. of 12-in., 400 ft. of 10-in. and 600 ft. of 8-in. Please advise how to set the first two strings in cement in a hole that is nearly completed.—P. J. D., Indianapolis, Ind.

The details you have given are too indefinite to give a specific answer and it will therefore be necessary to assume certain conditions. The method to be used for cementing depends on the conditions in the well more than any one thing.

It also might be well to consider whether it is necessary to run these intermediate strings of pipe. If it is at all possible to do so, it would be far more economical to run only a short surface string and then a pay string with the latter being landed and cemented right on top of the pay. This will exclude any water from the oil zone and that is one of the principal reasons for putting casing in the hole.

If the well has no water in it at the time of cementing the casing, it will be necessary to bridge the hole just below the casing point; it might also be best to do this even if the hole is full of water or fluid. The bridge can be built by running a wooden plug and then dumping gravel or sand on top of this plug.

After running the casing and getting it at or near its final location, the cement can be mixed by hand in a trough or tank on the surface and shoveled into the casing. Care should be taken not to shovel it in too fast or it might bridge in the casing. After the cement has been dumped into the casing, the casing can then be worked up and down to make the cement equalize inside and outside the casing. As you can see, this leaves an excess of cement inside the pipe.

Another method is to assemble as heavy tool string as possible and run it in the hole on top of a plug. The top and bottom of the plug should have a gasket, or cup, made from old belting. If the tools are heavy enough, the plug will force the cement out and around the pipe. If there is any doubt about the weight of the tools being sufficient to do this, the plug can be placed in the pipe, and water run in the casing while the tools are run on top of the plug. It is evident that it is assumed that cable tools will be used.

Two-Plug Cement Job

Where the hole is full of water, some operators use a two-plug cement job. A plug, such as the one described above, is placed in the pipe and cement slurry pumped on top of it, a second plug inserted in the pipe on top of the cement and then water pumped in on top of this plug. It is evident that a pump having a fairly high fluid and pressure capacity must be used. A swedge can be used in the top of the casing for connecting the pump.

When the bottom plug goes out of the pipe, the cement following it will be forced around the pipe. Care must also be taken not to pump the second plug out of the bottom. By proper selection of the casing shoe and proper design of the plugs, this also can be prevented.

A third method which can be used requires the running of a cement retainer on the tubing and, after setting the retainer, pumping the cement through the tubing and out and around the casing. Displacement of the cement requires that water follow it.

In displacing cement, the equation for equal volumes may be used and if the calculations are made with reasonable accuracy, no large amount of cement should be left in the casing or tubing. Where only the tools are used to force the cement out of the pipe, measurements will have to be on the drilling line. Do not force all of the cement out of the pipe or a poor job will result.

Enough cement should be used to adequately seal off any water above the oil zone. For supporting the casing string, at least 300 ft. of cement should be behind the pipe. The amount of cement to be used can be obtained by consulting the tables in Section F of the Drilling Equipment Directory. The cement slurry should be distinctly fluid, although not too thin. A 50 or 55 per cent slurry will be suitable for cementing through the casing while a 60 or 70 per cent slurry will do for the tubing job. A 50 per cent slurry is 0.75 cu. ft. of water per sack while a 65 per cent slurry is 0.975 cu. ft. of water per sack.

As to the cost of the job, the amount of money spent will depend on the method and amount of cement used. There are several firms operating in nearby territories that have all of the equipment necessary to do any type job, and can also give the necessary technical advice. If the well is of sufficient value to stand the expense, it would be well to hire them for the job. For the type jobs outlined above, the expense will also include the cement. It is advisable to purchase only the best grade of cement for this type job.

Progress in METALS

By W. L. NELSON

Stocks of Molybdenum Steels For the Petroleum Industry

DOUBT is sometimes voiced concerning the availability of alloy steel warehouse stocks. Although this may have been a difficulty in the past, the situation is now definitely clear. The Climax Molybdenum Co. reports that there are more than 200 warehouses in the United States that stock molybdenum steels. A listing of the warehouses in the cities which manufacture most of the drilling equipment of the industry is given on this page.

The Society of Automotive Engineers numbering system is used to designate the various steels. The first digit in the number is always four because all of the steels are molybdenum steels. The second digit in the number is used to designate the kind and amount of other elements that is present, as:

Series—
4100 About 0.8 per cent chromium; 0.2 molybdenum
4300 About 1.75 per cent nickel; about 0.8 per cent chromium; about 0.3 per cent molybdenum
4600 About 1.8 per cent nickel; 0.25 per cent molybdenum
4800 About 3.5 per cent nickel; 0.25 per cent molybdenum.

The last two digits designate the hundredths of a per cent of carbon contained in the steel, i.e., a 4140 steel contains approximately 0.40 per cent carbon.

The information given in the table is subject to change because stocks vary widely and demands change. The date of the listing is June 1940.

Doubtless other alloy steels besides the molybdenum steels are stocked widely throughout the country.

Costs of Cutting Steel Scrap

SCRAP-CUTTING costs with gas differ quite widely because hardly any two jobs are ever handled the same. Use of power shears for reducing thin plates and bars to charging-box size and turning over usable materials, such as pipe, shafting, pulleys, gears and other mill-uncut equipment introduce unknown factors in some cases that can only be guessed at. Costs for oxygen and acetylene vary also, depending on the volume consumed and the locations of the customers. Probably the most satisfactory method is to compute from gas consumption and operator man-hours per ton on scrap. With these data the calculation of probable scrap-cutting costs is made comparatively simple when gas costs and hourly wage rates are known.

Although the following quotations which are responses received to a questionnaire conducted by the Air Reduction Sales Co., New York City, do not pertain alone to conditions in the petroleum industry, they should assist in fixing the cost of scrap cutting in this industry. While they illustrate the variable cost conditions in the steel-scrap field they also indicate that the costs of cutting miscellaneous scrap the country over are not too widely apart.

Wheeling, W. Va.—Scrap dealers claim the cost of miscellaneous scrap in this territory is $2 per ton, cut and loaded on freight cars, provided the haul to the railroad is short. A cost of $2.50 is allowed per distance from a railroad siding.

Detroit, Mich.—All-steel hopper cars, weighing 19 tons, including trucks, cut to car-loading dimensions, required 690 cu. ft. of oxygen, 87 cu. ft. of acetylene, and 7¾ labor hours.

Philadelphia, Pa. — Local scrap dealers' figures range from $2 to $3 per ton as cost of preparing miscellaneous scrap for shipment.

Houston, Tex.—The cost of scrapping locomotives was $2.30, all-steel cars $1.40, and wood and steel cars $2 per ton in one scrapping operation. Gas consumptions were not available.

New York.—Scrap cutting is figured by the average scrap man in this territory at about $1.50 per ton. Some of the large dealers figure less than this.

Oklahoma.—Miscellaneous scrap cutting costs about $2.25 to $2.50 per long ton, based on gas costs.

Charlotte, N. C.—On a small job in 1936 where cranes and other facilities for handling were not provided the cost was $1.50 per long ton when started. The cost was reduced to $1.25 after the job was organized. Have been informed by scrap dealers that the average cost of miscellaneous scrap runs about $1.50 per ton to cut, assort and load on cars for shipment. The cost of scrapping 58 locomotives, when salvaging usable material, was $1.78 per ton in 1939.

A tentative summary by the Air Reduction Sales Co. of figures received so far indicates the following:

GAS CONSUMPTION AND CUTTING LABOR PER LONG TON STEEL SCRAP CUT TO CHARGING-BOX SIZE

(18 in. by 60 in. with Airco Style 144 No. 2 Cutting tips, 40 lb. oxygen pressure and 4 lb. acetylene pressure)

	Oxygen (cu. ft.)	Acetylene (cu. ft.)	Labor (hours)
Ships	70	12	1.2
Locomotives	90	18	1.3
Cars (all steel)	60	12	1.0
Cars (wood and steel)	70	14	1.0
Miscellaneous	95	16	1.5

SHAPES AND SIZES OF ALLOY-STEEL STOCKS AVAILABLE IN WAREHOUSES*

Location—	S.A.E. 4120	S.A.E. 4130	S.A.E. X4130	S.A.E. 4140	S.A.E. 4150	S.A.E. 4615	S.A.E. 4620	S.A.E. 4650	S.A.E. 4340
LOS ANGELES†:									
1 warehouse	billets 1½"-7" hot rolled rounds	billets ⅝"-3¼" hot rolled rounds					billets ½"-13" hot rolled rounds		1"-13" hot rolled rounds
3 warehouses				billets ½"-6" hot rolled rounds 1¾"-4½" hot rolled squares		billets ½"-13" hot rolled rounds			
OAKLAND, CALIF.:									
1 warehouse	billets 1½"-7" hot rolled rounds					½" squares	billets ½"-13" hot rolled rounds	8" squares	
2 warehouses				½"-13" hot rolled rounds 1¾"-4½" hot rolled squares		billets ⅝"-13" hot rolled rounds		⅞"-3" hot rolled rounds	
SAN FRANCISCO, CALIF.‡:									
1 warehouse				billets	¼"-7" rounds 1"-4" squares				billets 1"-3" hot rolled rounds
CHICAGO¶:									rounds
1 warehouse					billets ½"-8" rounds				
2 warehouses		½"-6" hot rolled rounds		billets		billets	½"-6½" rounds		
HAMMOND, IND.§:									
WICHITA, KANS.:									
1 warehouse			sheets tubes	⅛"-3¾" rounds					
ST. LOUIS, MO.‖:									
HOUSTON, TEX.**:									
1 warehouse				billets 6"-12" hot rolled squares		⅞"-4½" hot rolled rounds and cold finished			

*Molybdenum tool steels are stocked in all of the cities except Hammond, Ind., and Wichita, Kans. †Two warehouses stock S.A.E. X4130 rounds and seamless tubes ‡Two warehouses stock S.A.E. 4140 ¼-in. to 4-in. squares and five warehouses S.A.E. 4140 ½-in. to 8-in. hot rolled rounds. ¶Four warehouses stock S.A.E. 4615 ½-in. to 6½-in. hot rolled rounds and seven warehouses stock S.A.E. 4,140 ½-in. to 8-in. hot rolled rounds. §One warehouse stocks S.A.E. 4140 ⅜-in. to 1¼-in. hexagons and ⅝-in. to 6-in. rounds. ‖One warehouse stocks 4140 ⅝-in. to 5-in. hot rolled rounds. **Two warehouses stock S.A.E. 4140 ⅝-in. to 4½-in. hot rolled rounds.

Pipe-Line Activity

Standard Denies That Pipe-Line Dividends Constitute Oil Transportation Rebate

HAMMOND, Ind., Jan. 21.—Denial that dividends paid by Stanolind Pipe Line Co. constitute a transportation rebate or offset in any manner was made by Standard Oil Co. (Indiana) this week in its answer to the government suit alleging violation of the Elkins Act. The suit is now pending trial in federal District Court, Northern District of Indiana, Hammond division. It is one of three such suits filed September 30 by the Department of Justice at the same time antitrust proceedings were instituted against 22 major oil companies and the American Petroleum Institute.

Since acquiring 100 per cent of Stanolind Pipe Line Co. stock, effected in two stages at total cost of $58,889,913.70, Standard of Indiana claims that approximately $135,000,000 has been spent in enlarging the system to its present stature.

Dividends paid by the pipe-line company to the parent organization during the past 9 years have amounted to approximately $91,653,439, the answer relates. Standard's answer defends its relationship with the pipe-line company by pointing out that there has been no change over a long period of years and that its annual reports filed with the Interstate Commerce Commission and other federal agencies have been a matter of public record. The inference is drawn that the relationship between the parent and subsidiary can not be unwholesome or in violation of the Elkins Act because more than ample opportunity for legal attack existed since 1916.

"Dividends," declares the answer, "were not rebates and offsets but were in truth and in fact actual dividends paid in cash by the pipe-line company pursuant to authorization of its board of directors and were so recorded upon its books and records of account. Defendant received such sums as dividends and recorded the payment thereof upon its books and records of account as dividends received."

Exception is taken in the answer to the Government's claim that returns in the form of dividends represented an average of slightly more than 36 per cent on capital investment. In this connection the answer declares:

"Computing the rate of return solely upon the price paid by defendant for the stock of the pipe-line company, less capital distributions thereafter made, said dividends aggregating $91,653,439, after eliminating therefrom the portion thereof constituting capital distributions, represented an average return for the years 1931 to 1939 of less than 19 per cent, instead of slightly in excess of 36 per cent as alleged in the complaint."

To enjoin or restrain the payment of dividends, as prayed in the complaint, would, the answer avers, deprive defendant of its property without due process of law and result in the taking of its property for public use without just compensation in violation of the Constitution.

In defense of the rates through which dividend payments by the pipe-line company were made possible, Standard of Indiana answer points out that they are established with approval of the I.C.C. and that they have been under investigation by the government agency since 1934 when a voluntary reduction was ordered held in abeyance.

In another part of the answer, the defendant gives a brief history of the Elkins Act. It is pointed out that provisions of the act apply specifically to railroads in prohibiting carriers from transporting their own commodities. Language of the bill itself was made more specific to exclude pipe lines, along with other carriers, at the time it was enacted by Congress. Point is also made of the failure of proposed pipe-line divorcement legislation to receive favorable consideration before Congress and its various committees during the past several years.

New Line Will Move Oil Destined for Ontario

British American Oil Co., Ltd., has contracted for crude-oil purchases in excess of 1,500,000 bbl. in the southern Illinois area which will come from Continental Oil Co. and others. Production of Continental in the area will be purchased by this arrangement and Continental will own a half interest in the gathering system which is part of the pipe-line system of approximately 30 miles now being laid for Toronto Pipe Line Co., British American subsidiary, which will take oil from the Keensburg, Griffin and Albion pools in Illinois. Oil coming from the Toronto Pipe Line system in the area will be moved to Toledo, Ohio, through trunk lines of Sohio and Illinois pipe-line systems. At Toledo oil will be loaded on tankers and shipped across Lake Erie and Lake Ontario for delivery at the British American refinery at Toronto, Canada.

H. C. Price Co. Is Completing Welding of Consumers Line

By the end of this week welding of 21 miles of 12¾-in. natural-gas pipe line for Consumers Power Co. will be completed by the H. C. Price Co. organization. This line extends from Dice's Corners, west of Midland, Mich., to the Wise field station. No decision has been reached yet regarding construction of additional lines which have been proposed as additions to the Consumer system.

Other work under way by H. C. Price Co. is the welding of lines laid for Stanolind Pipe Line Co. over about 15 miles of right-of-way in the vicinity of the TNT plant being built near Wilmington, Ill. In this same locality, H. C. Price Co. has work under way on a similar project to weld 10 miles of 14-in., 10 miles of 10-in., and 10 miles of 8-in. for Sinclair Refining Co., pipe-line department. Sheehan Pipe Line Construction Co. is the general contractor for both the Stanolind and Sinclair jobs.

The Price organization is also welding 22 miles of 8-in. for Kaw Pipe Line Co. between Gorham and Bemis pools of Kansas, and 7 miles of 4½, 5, and 6-in. for Pure Transportation Co. in the vicinity of Olney, Ill., and nearly 30 miles of 4-in. and 6-in. for Toronto Pipe Line Co. in southern Illinois and Indiana.

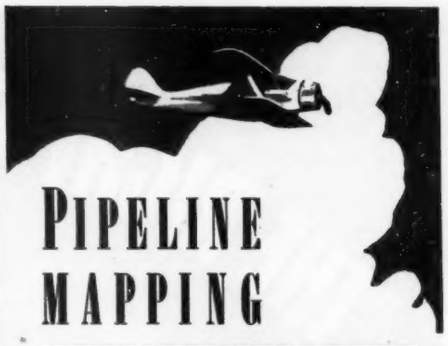
R. H. Fulton Constructs Line for West Texas Gas

West Texas Gas Co. is to construct a 14-mile 8-in. gas line from the North Cowden field into Odessa to connect with its line from the Canadian River station north of Amarillo to Midland and Odessa. The line will supplement the present line to insure sufficient gas for the most severe weather. Cost of the line will approximate $75,000. R. H. Fulton, Lubbock contractor, has the job.

Cities Service Oil Co. is spending $175,000 for improvements at its North Cowden natural-gasoline plant to process the gas and sweeten it to conform to the same type of gas now being used.

Corsicana, Tex., to Vote on Proposed Natural-Gas System

An election will be held on January 28 at Corsicana, Tex., to determine whether the city will issue bonds to provide for the construction of a municipal natural-gas distributing system and compressor station which will cost about $400,000.



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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

As in 1940, drilling is starting at a low ebb, running even lower than last year. However, 1940 turned out to be a more active year than any since the depression with the exception of 1937. At the beginning of last year, there was only one boom in sight, namely the Devonian play in Illinois. There were, of course, other fields to be developed, but this development was of a routine nature. This year, there is a Trenton play in Salem in Illinois, which will probably not be as extensive as last year's orgy. Mississippi is slowing up but the Fort Worth basin play is just getting under way with a large crop of late-1940 discoveries to be developed. In California expiring leases require much wildcatting and already there are signs of increasing activity in the Los Angeles area which may develop into town-lot drilling. Kansas has started off stronger than last year and will probably contine to run above last year's levels. Then, of course, there is the East Texas campaign, which is barely getting under way with a growing influx of operators in search of Woodbine production. Drilling in 1941 should increase over the next few months, at least.

CALIFORNIA: After a year and a half with no important discoveries, California enjoyed a most successful week. A new gas field was brought in in San Joaquin County near the Tracy field. The Newhall-Castaic district may have its second field in a few months as a test in Oak Canyon is showing oil. It has not yet been tested. Eocene production was extended north in Kettleman Hills, although not beyond the limits of Temblor production. In the Los Angeles Basin, the second deep test at Inglewood is not giving encouraging results, and Union Oil Co. has passed the 12,000-ft. level in Dominguez without encountering favorable showings. Paloma is now established as a distillate field and plans are under way for its development. Oil sand was cored in a test about midway between Rio Bravo and Greeley. (p. 72).

TEXAS GULF COAST: A second location increases interest in La Ward, Jackson County prospect, although the first well has not yet been successfully tested. A new sand is in prospect at Rowan, Brazoria County (p. 69).

OKLAHOMA: A 52,000,000-cu. ft. gas well opened a new pool southwest of Okemah in Okfuskee County. The Harvey and Henry discovery, also in Okfuskee, gaged 93 bbl. in 1 hour on test and the South Konawa field in Pottawatomie County got a well which made 187 bbl. an hour (p. 75).

MONTANA: Eight gas wells were completed in four districts in Montana. Gas production is continually assuming larger proportions in the state as distribution facilities are increased (p. 67).

KANSAS: Arbuckle production was extended ⅜ mile in Kraft and ¾ mile in East Trapp. Topeka lime production was extended ⅜ mile in the Beaver pool (p. 61).

OHIO: A Geauga County test formerly abandoned in the Clinton has started up again to test the Trenton (p. 64).

LA-ARK-TEX: Three Wilcox sand failures dim the possibilities of the trend play in northern Louisiana (p. 60).

LOUISIANA GULF COAST: The Gueydan field, which was not considered important, is being regarded in a new light as a flank well flows 210 bbl. from a deep sand. Bayou de Glaise flank production continues elusive as another test flows and then sands up. Lakeside, Cameron Parish, is established as a distillate pool. A possible new horizon has been uncovered at Port Barre, St. Landry Parish (p. 82).

SOUTHWEST TEXAS: The Dimmit County well which has been showing production is finally tested for 3 bbl. an hour on the pump. After cleaning out it flowed 25 bbl. in 11 hours. Although not high, this record attracts attention to a virgin area. La Gloria and Alice in Jim Wells County, and North Rincon in Starr County have all been extended. Willamar's second test is running below the discovery well with little showing (p. 62).

ILLINOIS: Rossi's Trenton well in Salem is estimated to be a 200-bbl. well and has started 20 wells for the Trenton already. A McClosky pool is opened in Edwards County and a Cypress pool in Marion, near Patoka (p. 79).

EASTERN TEXAS: Radiating out from the Woodbine sand discovery at Hawkins in Wood County, the entire eastern Texas district is undergoing the most intense lease play since the early stages of the East Texas field. Practically all counties have and are sharing in the spreading lease play. Several of the long known structures in the district are being readied for immediate testing (p. 83).

COMPLETIONS IN ALL FIELDS . . .

(Week ended January 18, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	73	17	5	95	258	219
Ohio	4	15	11	30	71	41
Indiana	7	0	2	9	19	12
Kentucky	4	3	4	11	26	15
Illinois	35	0	15	50	162	206
Michigan	7	1	6	14	42	70
Kansas	22	0	8	30	80	69
Oklahoma	19	3	5	27	84	88
Nebraska	1	0	1	2	8	0
Texas:						
North Central Texas	12	1	13	26	130	154
West Texas	24	0	2	26	102	96
Texas Panhandle	6	0	0	6	20	36
Eastern Texas	15	0	4	19	60	33
Texas Gulf Coast	16	2	3	21	51	74
Southwest Texas	19	0	12	31	71	108
Total Texas	82	3	34	119	434	511
North Louisiana	3	2	4	9	29	48
Louisiana Gulf Coast	8	0	4	12	38	47
Total Louisiana	11	2	8	21	67	95
Arkansas	1	0	4	5	12	16
Mississippi	1	0	2	3	9	0
Montana	3	8	2	13	20	13
Wyoming	3	0	2	5	13	13
Colorado	0	0	0	0	0	2
New Mexico	2	0	2	4	17	40
California	20	2	4	26	69	59
Total United States	295	54	115	464	1,393	1,469
Total previous week	335	34	93	462		
Week ended Jan. 20, 1940	320	36	119	475		

NEBRASKA: Wildcatters are extending their activity into Otoe County, west of Falls City, as operations in that pool decline to a minimum (p. 61).

MICHIGAN: The second well in the Winfield-Montcalm pool came in for 500 bbl. from the Monroe to make this area more promising. The discovery was a 40-bbl. well. The Monitor area, around Gulf's deep well, is attracting much attention as a new well a mile north of the deep test filled with oil from a shallow sand (p. 84).

WEST TEXAS: Deep exploratory activity in the Permian basin again held the attention this week in the district as shows of oil were reported in an Ordovician wildcat west of the Abell field and as new activity was registered for the Abell field itself (p. 83).

NORTH TEXAS: New wildcat tests topped the news of the week in this district as five tests were planned and several of the eight new ones staked the previous week were started. Many of the little developed deep fields from the Strawn and Bend sections throughout the district are being marked for thorough development during the coming year (p. 80).

WEST CENTRAL TEXAS: Jones County's new Swastika field discovery of a week ago was officially gaged for one of the most promising new strikes in the district in several months. Humble 2 Sears made a daily rating of 1,182 bbl. New development was started in Fisher County's recent Swastika strike, while activity continues at the Olson or North Avoca field in Jones County (p. 80).

Three Wilcox Trend Failures May Diminish Activity

By
GEORGE WEBER

SHREVEPORT, Jan. 20.—Further failures in Wilcox wildcats and outposts marked a quiet week in the tri-state area. Another gas horizon is producing in the Athens field of Claiborne Parish, but oil shows have thus far failed to prove commercial. In the nearby Sibley field, a deep oil show also failed to be productive, and another gas well was completed.

Wilcox Play

Three additional failures were marked in the Central Louisiana, Wilcox play last week. In La Salle Parish, Hunter Co. 1 Pipes recorded no shows and was abandoned at 4,009 ft., 709 ft. in the Wilcox. H. L. Hunt 1 Ayers, Tensas Parish, also was abandoned in the Wilcox at 4,305 ft. The Nebo field, La Salle Parish, received its first dry hole, defining production on the northeast. H. L. Hunt 9-C Goodpine tested salt water in the Wilcox producing sand and was abandoned at 3,924 ft. The test was an outpost, located ½ mile north of the discovery well in the field, and northeast of the field as now developed.

Two wells were completed at Olla, one a gasser, and new activity continues throughout the Wilcox trend. A wildcat will begin about March 1 in the Dodson area of Winn Parish, and a new Caldwell Parish wildcat was staked this past week, east of Kelly.

Athens Test

Skelly Oil Co. and Sunray Oil Co. have been reworking 1 Valentine to test upper horizons, after bringing in a gas-condensate discovery several weeks ago. The first attempt, squeezing the gas producing pay at 6,316-33 ft. and plugging back to perforate at 5,326-34 ft., tested salt water. The section was squeezed and reperforated at 5,316-27 ft., and fluid consisting of 97 per cent salt water and 3 per cent oil was swabbed at the rate of 6 bbl. hourly. Operators then squeezed perforations, drilled out to 6,018 ft. and perforated at 5,826-34 ft. in the top of the Pettit. A show of gas caused them to acidize and the well then tested an estimated 8,000,000 cu. ft. of gas, together with 2½ bbl. of condensate hourly, through a 20/64-in. choke, at a tubing pressure of 1,100 lb. At latest reports the well was being tested in this pay.

SUMMARY OF COMPLETIONS

North Louisiana

	No.	Prod.	Footage
Oil wells: Caddo	2	110	3,696
Olla	1	135	2,407
Gas wells: Olla	1	20	3,503
Sibley	1	30	5,824
Dry holes: Bull Bayou	1	.....	2,745
Nebo	1	.....	3,924
Wildcats	2	.....	8,314
Total	9	.....	30,413

Arkansas

Oil wells: Magnolia	1	600	7,517
Dry holes: Smackover	1	.....	2,278
East El Dorado	1	.....	3,075
Urbana	1	.....	3,608
Wildcats	1	.....	676
Total	5	.....	17,154

*Million cu. ft.

Sibley Gasser

Another deep show of oil in the Sibley gas field proved non-productive last week, when Moffitt & Perritt tested 1 Kennon. The well showed the gas section at 5,591-5,655 ft. and cored lime with an oil odor at 5,781-5,824 ft., but small recovery prevented operators from knowing how much section showed oil. A string of 5½-in. casing was set at 5,822 ft., and perforations were shot at 5,783-89 ft. The well showed salt water, and was plugged back to the regular gas zone and completed, for a potential open flow of 30,000,000 cu. ft.

Lisbon Activity

Recent deep shows at Lisbon have resulted in two new tests in the field this week. F. B. King has staked 1 King about 1 mile west-northwest of the J. D. Caruthers deep test. In a southeast offset location to the Caruthers test, C. H. Lyons et al are going back in 1-A Lloyd to deepen it from its former total depth of 5,223 ft., where it has been producing oil from the Pettit since May, 1938. The oil sand discovered in the transitional zone above the top of the Hosston (Travis Peak) formation by Caruthers, and first opened to production in the Oakes, Caruthers & Morelock 1 Whitman, may be the object of a number of Lisbon tests this year, since the oil is sweet, and the gas-oil ratio is not prohibitive.

Joaquin Development

Further development in the Joaquin gas field of Shelby County, Texas, and De Soto Parish, Louisiana, is seen in the entrance of the N. & W. Corp. (Noe & Woods) gas producers in the Monroe field. The operators have staked 1 Sloan et al in Sec. 18-11-15, having purchased acreage in the Sabine River bed. Southern Production Co., Inc. has two rigs running in the field, and a few days ago completed a well for an estimated 177,000,000 cu. ft. open flow potential.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	Jan. 18	Jan. 11
Caddo light	5,840	5,900
Caddo heavy	2,200	2,430
Cotton Valley	13,435	13,600
Cross Lake	3,265	2,830
De Soto	980	1,050
Haynesville	2,610	2,620
Homer	2,750	2,650
Lisbon	2,800	3,000
Olla	9,050	8,825
Rodessa	16,565	16,155
Sligo	2,360	2,465
Sugar Creek	1,015	1,110
Urania	2,235	2,250
Zwolle	1,350	1,360
Total North Louisiana	69,040	68,830

SOUTH ARKANSAS

Rodessa, Texas	16,260	16,250
Atlanta	2,450	2,425
Buckner	2,185	2,160
Champagnolle	1,240	1,165
Dorcheat	1,350	1,350
El Dorado	1,585	1,625
Magnolia	19,600	19,600
Nick Springs	1,150	1,120
Rodessa	1,705	1,700
Schuler	16,625	16,500
Smackover light	1,675	1,680
Smackover heavy	13,550	13,550
Troy	1,200	1,200
Urbana	1,675	1,650
Village	1,005	1,025
Total	69,965	69,560

NORTH LOUISIANA COMPLETIONS

Caddo—Caddo Parish

L. L. Sugar 1 Sugar ..... NW 32-21-15
Pumped 10 bbl., T.D. 2,114 ft., 5½-in. casing 2,112 ft.
Texas Co. 8 Raines ..... NW NW NE 27-21-15
Pumped 100 bbl., T.D. 1,582 ft., 6⅝-in. casing 1,426 ft., 4,000 gal. acid.

Bull Bayou—De Soto Parish

Geo. Lilly et al 1 Albritton ..... NE SE 35-12-11
T.D. 2,745 ft. 5½-in. casing 2,740 ft. perf. 2,620-32 ft., salt water.

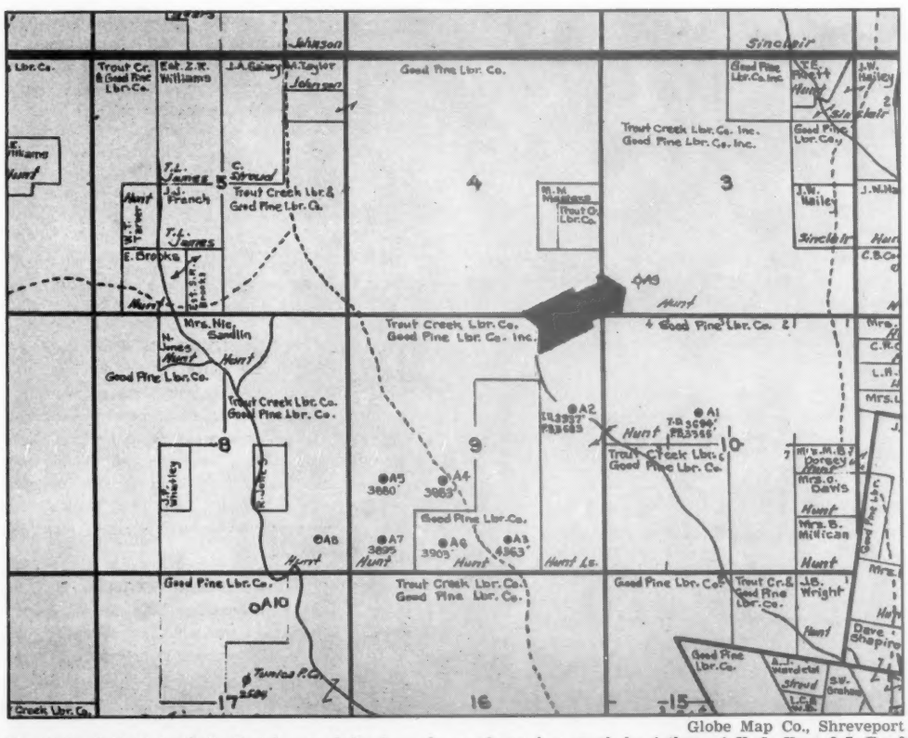
Nebo—La Salle Parish

H. L. Hunt 9-A Goodpine ..... SW SW 3-7-3e
T.D. 3,924 ft., salt water.

Olla—La Salle Parish

Louark Producing Co. 1 Sills ..... SE NW 25-10-2e
T.D. 3,503 ft., 7-in. casing 2,418 ft., perf. 2,780-90 ft., 20,000,000-25,000,000 cu. ft. dry gas.
Placid Oil Co. 68 La. Central ..... SE NW 36-10-2
135 bbl., 32 per cent salt water 18/64-in. choke, T.P. 110 lb., C.P. 320 lb., 7-in. casing 2,405 ft., perf. 2,216-20 ft.

(Continued on Page 85)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Sinclair
Trout Cr. & Good Pine Lbr. Co.
Good Pine Lbr. Co.
Trout Creek Lbr. Co. Inc. Good Pine Lbr. Co. Inc.
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Trout Creek Lbr. Co. Good Pine Lbr. Co.

By
ROBERT INGRAM

Kraft and East Trapp Pools Get Minor Extensions

PRODUCTIVE limits of the Kraft-Arbuckle pool of Barton County were extended west ⅝ mile this week by Magnolia Petroleum Co. 1 Riemann, S½ SE SE 4-17-11w, and Arbuckle dolomite production in the East Trapp pool was extended ¾ mile east on the Barton County side at Earl F. Wakefield and Leonard Isern 1 Miller, NE NE SE 17-16-13w, where casing is being run to 3,393 ft.

The 1 Riemann filled 3,000 ft. with oil from a total depth of 3,292 ft. in the Arbuckle dolomite and crews were bailing and cleaning out to test further. Meanwhile, in the same field, the Texas Co. was drilling below 1,350 ft. at 8 Disque, W½ E½ SW 3-17-11w, another outpost.

The Beaver pool of northeastern Barton County was also extended ⅝ mile to the northeast by V. D. Martin and V. H. Hearing 2 Nick Feltes, SE NW SE 8-16-12w. The well filled 1,800 ft. with oil from the Topeka lime topped at 2,894 ft. and penetrated to 2,901 ft. It was treated with acid, but could not be completed because the swab was lost and crews are now fishing.

SUMMARY OF COMPLETIONS

Kansas

	No.	Bbl.	Footage
Oil wells:			
Zenith	3	1,676	11,505
Kraft	1	350	3,380
Stoltenberg	4	3,703	13,087
Hall-Gurney	3	6,506	8,837
Silica	2	663	5,287
Other fields	8	9,310	22,815
Wildcats	1	1,254	3,313
Total	22	23,462	68,224
Dry holes: Bornholdt	1	.....	3,400
Other fields	3	.....	8,390
Wildcats	4	.....	16,151
Total	8	.....	27,941
Recompletions: Trapp	1	286	.....

Nebraska

Oil wells: Falls City	1	216	2,246
Dry holes: Falls City	1	.....	2,259
Total	2	.....	4,505

Fields Keep Active

In spite of a week of wet weather which bogged down many a truck and car in mud and forced suspension of operations in some localities, field activity continued high with 47 first reports and 30 completions. Among new wildcat and outpost locations, of which there were 13, was that of Trees Oil Co. which was moving in rotary tools to drill 1 Plandwehr, SE SE 17-32-1e. The drill site is 6 miles southeast of the Wellington pool, the nearest production, and is situated in the center of a large block taken along a north-south trend and assembled 3 years ago. The structure was originally mapped by core-drill and checked with subsurface.

KANSAS COMPLETIONS

Barton County

Kraft pool: Carter 1 Burmeister, E½ SE SW 2-17-11w, pumped 350 bbl., Arbuckle 3,359-80 ft.
Silica pool: Magnolia 19 Roetzel, E½ SE NE 24-20-11w, pumped 121 bbl., Arbuckle 3,254-76 ft.

Butler County

Brandt pool: Rex & Morris 4 Cannon, N½ SW SW 15-28-7, dry, Mississippi 2,666 ft.
El Dorado field: Cities Service 195 Wilson, NW NW SE 8-25-5, pumped 74 bbl., Kansas City 1,962-2,010 ft.
Thompson pool: F. O. Barker 1 Thompson, W½ NW SW 2-24-3e, dry, T.D. 2,560 ft., Lansing 1,894 ft., Mississippi 2,518 ft.

Cowley County

Rock pool: Arthur Brewer 4 Winfield, SW NW SW 15-30-4e, pumped 85 bbl., Barton 2,773-84 ft., T.D 2,787 ft.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	Jan. 18	Jan. 11
Burrton	7,950	7,650
Ritz-Canton	4,150	4,100
Graber	2,550	2,900
Hollow-Nikkel	1,400	1,450
Voshell	1,800	1,750
Wellington	1,300	1,400
Lorraine	1,350	950
Stoltenberg-Wilkins	5,241	4,025
Bloomer	4,700	4,450
Chase	5,350	5,100
Geneseo	4,450	4,800
Silica	17,550	15,050
Wherry	3,400	2,850
Trapp district	15,400	13,950
Balance Russell County	20,550	19,450
Sedgwick County	3,200	3,150
Bemis	9,100	9,800
Burnett	6,900	6,650
Kingman County	1,155	615
Stafford County	11,375	9,655
Greenwood County	8,250	8,000
El Dorado	6,950	6,900
Total Kansas	199,200	189,000

Ellis County

Bemis pool: Cities Service 17-B Hall, E½ E½ SW 26-11-17w, 3,000 bbl., Arbuckle 3,548-55 ft., acid.
Burnett pool: Wakefield 2-E Burnett, W½ NE NE 1-11-18w, potential 1,643 bbl., Arbuckle 3,529-32 ft.

Ellsworth County

Stoltenberg pool: L. W. Prunty 2 Skalicky, EL NW NW 9-16-10w, swabbed 260 bbl., in 8 hr., Arbuckle 3,275-82 ft.
Emerich et al 1 Schraeder, EL SE NW 28-16-10w, pumped 50 bbl., Arbuckle 3,303-22 ft., T.D. 3,328 ft.
Aylward 3 Ehler, NW NE SW 35-16-10w, pumped 393 bbl., Arbuckle 3,291-99 ft.
Pryor & Lockhart 7 Stratman, NL NW NE 2-17-10w, 3,000 bbl., Arbuckle 3,269-78 ft.

Greenwood County

Virgil pool: Shaffer & Howell 1-A Imthurn, SE NE NW 9-23-13e, 5 bbl., Mississippi 1,782-90 ft., T.D. 1,800 ft.

Marion County

Lost Springs pool: Lorieau & Harrington 6 Forsberg, SE NE SW 21-17-4e, pumped 150 bbl., Mississippi 2,355-88 ft.

McPherson County

Bornholdt pool: Continental 4 Johnson, S½ SE NE 31-20-5w, dry, T.D. 3,400 ft., some show of oil at 3,389 ft.

Pawnee County

Wildcat: Atlantic & Skelly 1 Wratil, E½ SE NW 15-22-15w, dry, T.D. 4,009 ft., Topeka 3,070 ft., Lansing 3,536 ft., Viola 3,870 ft., Simpson 3,938 ft., Arbuckle 3,986 ft.

Phillips County

Ray pool: Cetal 2 Ray, W½ SW NE 32-5-20w, potential 1,243 bbl., Basal sand 3,538-58 ft.

Republic County

Wildcat: Wilcox Oil & Gas 1 Hirman, SE NW 30-2-1w, dry, T.D. 3,565 ft., Topeka 1,817 ft., Simpson 3,420 ft., Arbuckle 3,554 ft.

Rice County

Silica pool: Skelly 3 Ira, N½ SW NW 27-19-10w, flowed 542 bbl. oil and 2,000,000 cu. ft. gas, Lansing 2,950-2,031 ft.

Rooks County

Lanton pool: Cooperative 6 Beardmore, S½ NW NE 10-9-16w, 3,000 bbl., Lansing 3,118-85 ft.

Russell County

Hall-Gurney pool: Skelly 9 Colliver, NL SE SE 28-14-13w, potential 2,017 bbl., acid, Lansing 2,853-2,954 ft.
Skelly 2 Phinney, S½ NE NW 30-14-13w, potential 2,850 bbl., Lansing 2,847-2,952 ft.
W. I. Southern 3 Berrick, NE cor. 6-15-13w, pumped 1,639 bbl., Lansing 2,918-30 ft., T.D. 2,931 ft.
Wildcat: Braden & McClure 1 Phillips: N½ NW SE 34-15-11w, pumped 1,254 bbl., acid, Gorham sand 3,307-13 ft.
Trapp-Coralena pool: Stanolind 11 Rosener, S½ SE SW 9-15-13w, old well plugged back from 3,361 ft. to 3,110 ft., pumped 286 bbl. in 8 hr., and 1,500,000 cu. ft. gas, Lansing 3,037 ft.
Greenvale North: Jones & Shelbourne 2 Lewis, W½ NW NE 28-14-12w, dry, T.D. 3,164 ft., Lansing 2,818 ft., Arbuckle 3,140 ft.

Stafford County

Zenith pool: Shell 4 Brown, NE NE SW 2-24-11w, flowed 145 bbl. in 4 hr. and 2,013,000 cu. ft. gas, Viola 3,686-3,751 ft.
E. H. Moore 7 Stewart, S½ NW SE 12-24-11w, flowed 91 bbl. an hr., Viola and Misener 3,713-33 ft.
Winkler-Koch 3 Equitable, E½ SW NE 15-24-11w, potential 1,440 bbl., Viola and Misener 3,781-3,821 ft.
Wildcat: Vickers Petroleum 1 Stewart, E½ NE NE 22-25-11w, dry, T.D. 4,072 ft., Topeka 2,991 ft., Simpson 3,980 ft., Arbuckle 4,062 ft.
Wildcat: Bay Petroleum 1 Campbell, E½ NE NE 33-24-15w, dry, T.D. 4,570 ft., Lansing 3,771 ft., Arbuckle 4,516 ft.

KANSAS DRILLING REPORT

Barton County

British-American 1 Linder.....NE NE SW 24-17-14w
Anhydrite 905 ft., drilling 3,047 ft.
C. Piggott 1 Beran.....E½ NE NE 24-17-12w
Fort Riley 1,660 ft., drilling 2,725 ft.

Brown County

McAlpine 1 Tyler.....NE SW SW 4-3-15e
Drilling 250 ft., 15-in. 88 ft., 10-in. 225 ft.

Butler County

L. D. Davidson 1 Burnham.....E½ SE SE 2-28-7e
First report.

Cowley County

Sinclair-Prairie 1 Gibson.....SE SE NW 29-34-3e
Topeka 1,515 ft., Lansing 2,186 ft., show oil 2,200 ft., drilling 2,250 ft.

Ellis County

Stearns 1 Witt.....S½ NE SW 28-12-16w
Set 6-in. 3,452 ft., base Kansas City 3,545 ft., Arbuckle 3,609 ft., some show oil 3,609-16 ft., S.D. 2,626 ft.

Graham County

Gulf 1 Boller.....E½ SE SE 29-7-22w
Cellar.
Ewers-Simpson 1 Bundy.....SW SW 12-9-22w
Anhydrite 1,840 ft., T.D. 2,310 ft., hole off 10°, P.B. 700 ft., drilling 740 ft.

Greenwood County

C. E. Ash 1-B Taylor.....NW NE NW 7-27-12e
Set 8-in. 1,178 ft., Mississippi lime 1,755 ft., est. 500,000 cu. ft. gas 1,762-65 ft., 6-in. 1,765 ft., drilling 1,780 ft.
Aikman & Braden 1 Sasse.....NW NE SW 36-23-13e
T.D. 1,753 ft., acid, pumped 12 bbl. oil and 35 bbl. water in 8 hr.

Johnson County

McCain & Sherrod 1 Doan.....E½ NW SE 34-12-22e
(Old well), 5-in. 1,690 ft., T.D. 1,695 ft., some show of oil and water.

Leavenworth County

McLaughlin & Sons 1 Thorp.....C NE NE 27-10-20e
Viola 1,965 ft., drilling 2,050 ft.

McPherson County

Engle, Maybier 1 Carlson.....SW SE SE 8-20-5w
Cellar.

Nemaha County

A. C. Bumps 1 Achten.....S½ SE NW 12-4-14e
Set 6-in. 1,945 ft., underreaming at 1,960 ft.

Pratt County

George Reeves 1 Stark.....W½ SW NW 18-26-11w
Rotary rig.

Reno County

Perry Thayer 1 Roach.....NW NW SE 8-22-8w
T.D. 3,787 ft., bailed oil, installing pumping equipment.
R. E. Hess 1 McKee.....E½ NE SE 8-22-8w
Set 20-in. 70 ft., 15-in. 105 ft., running 12-in. 175 ft.

Rice County

Bunting-Dowling 1 Mantz.....W½ SW NE 17-19s-10w
Set 8-in. 220 ft., drilling 760 ft.

Russell County

Pryor & Lockhart 1 Weisenthal SW SE NE 30-15-11w
Set 15-in. 335 ft., drilling 45 ft.
Central Petroleum 1 Zeman....SW SW NE 16-15-12w
Location.

Stafford County

Earl Wakefield and Atlantic 1 Prescott.....
W½ NW SW 32-23-14w
Location.
Fain 1 Thole.....E½ SE SE 23-21-12w
Set 10-in. 238 ft., drilling 1,834 ft.

Sumner County

Benedum-Trees 1 Landwehr.....E½ SE SE 17-32-1e
First report.

FOREST CITY BASIN

ST. JOSEPH, Mo., Jan. 20.—Southeastern Nebraska field interest swung this week to Otoe County where two wildcat tests have been staked a considerable distance north of present production. Findess & Ziegler were digging cellar and pits for 1 Ritter, 26-7n-12e, and operators were moving in materials for Dr. Zimmer 1 Roddy estate, S½ SE SW 31-9n-14e. Exact location has not yet been reported for the Findess & Ziegler well.

The new area has also attracted attention because of work done in exploration, particularly with reflection seismograph.

(Continued on Page 62)

Dimmit County Well Proves Small; La Gloria Extended

By

F. L. SINGLETON

CORPUS CHRISTI, Tex., Jan. 20.—There are few important developments in the Southwest Texas district the past week. A small producer located in the Carrizo Springs area was opening the first production for Dimmit County, and an important extension was apparently recorded for the La Gloria field, Jim Wells County.

In the Balcones fault line district, and located in the Carrizo Springs area, Dimmit County, Producers Corp. 1 S. E. McKnight pumped at the rate of 3 bbl of 30.1 gravity oil per hour for 36 hours with a maximum pressure of 235 lb. At the end of the week, tubing had been pulled and rerun with a wall packer set 100 ft. off bottom, and the well started flowing, and in 11 hours it made 25 bbl. through open 2-in. tubing. The well is located in the G.W.T.&P. Survey 643, and production is from the Navarro sand at 2,292-98 ft., the total depth.

SUMMARY OF COMPLETIONS

Lower Gulf Coast

	No.	Bbl.	Footage
Oil wells: Fields	7	691	42,510
Dry holes: Wildcats	3	.....	20,111
Total	10	.....	62,621

Laredo District

Oil wells: Fields	9	888	31,510
Dry holes: Fields	5	.....	10,797
Wildcats	1	.....	2,063
Total	15	.....	44,370

San Antonio District

Oil wells: Fields	3	382	9,491
Dry holes: Fields	3	.....	3,968
Total	6	.....	13,459

Interest in the district was being attracted to Lewis Production Co. 1 Blatz, a wildcat located in the Martin Nester Survey which is drilling in shale below 2,300 ft. after logging interesting showings. Sand with an oil odor was cored at 2,058-67 ft., and on a 30-minute drill-stem test, 20 ft. of oily drilling mud was recovered. Additional sand with showing of oil was cored at 2,108-12 ft., and 2,115-20 ft., but no drill-stem test was made.

A new wildcat was announced for the Tanglewood area, Lee County, by Shell Oil Co. Inc., which is moving in material for 1 Brown located 2,000 ft. from the east line of the R. Finney Survey and 1,200 ft. from the north line of the Amasa Burchard Survey. The progress of this well will be watched with much interest in view of the interesting showings logged in a deep test recently abandoned by Fred Pederson.

La Gloria Field

La Gloria Operators Committee 1 M. Alby, located approximately 1 mile east of production in the La Gloria field, Jim Wells County, recovered 500 ft. of pipe-line oil on a 20-minute drill-stem test through perforated casing at 6,580-92 ft. Additional tests at 6,137-55 ft., and 6,180-6,205 ft. tested several hundred pounds working pressure and several feet of distillate cut mud. The committee staked location for 2 Alby, 7,300 ft. northeast of Magnolia 1 Stolze, a gas-distillate producer.

Possible Alice Extension

In the Alice field, Jim Wells County, H. H. Howell 1 Cummings, an outpost well is bottomed at 5,397 ft., with 5½-in. casing cemented at 5,205 ft., and the well is testing sand through perforated casing at 5,135-58 ft. This is one of the few wells that have been drilled in the field within several months, and the successful completion would mark up an important extension for the field.

In San Patricio County, Abbott & Traxler 1 W. W. Toland, which was reported abandoned at a total depth of 7,013 ft., has been taken over by D. P. Neill, who will set casing to test sand at 5,900-6,100 ft. The well is located about 2 miles northeast of Gregory in the Coleman Fulton Pasture Co. Land subdivision "A."

An important west extension was recorded for the North Rincon field, Starr County as Sun 1 Coates, flowed 25 bbl. of oil in 8 hr. while testing through perforated casing at 4,381-84 ft. Additional perforations had been made at 4,370-74 ft. and a new test was being made at the close of the week. The well is about 3,500 ft. from the company's 1 Saenz. An important location was announced by the company which is preparing to move material in for 1 Trevino, located about 1 mile south of the Kelsey field in Block 2 of the Santa Teresa grant.

Second Well in Willamar

Pan American 1-B Community, the second well to be drilled in the new Willamar field, Willacy County, and located about 1,100 ft. southeast of the discovery well is coring in shale below 7,943 ft. At this depth the well is approximately 200 ft. deeper than the discovery sand, and the only showing reported has been from 7,830-7,900 ft., where a drill-stem test showed 73 lb. working pressure and recovered 79 ft. of drilling mud and 90 ft. of oily mud.

In Calhoun County, and located about 7 miles southwest of the Powderhorn field, Continental Oil Co. staked location for 3 W. L. Moody, a projected 6,500-ft. Miocene sand test located in Section 9, Block B of the Garcia Survey.

In the Riverside field, Nueces County, Stanolind 2 J. A. Thompson attempted to blow out when tested at 6,926-32 ft., and the company is trying to control the pressure before testing. The well has been in the process of testing for the past 2 weeks, and has shown gas and distillate in two tests at 5,100 ft.

Location for another deep test was announced for the McCampbell field in Aransas and San Patricio counties. The well will be drilled by Sam E. Wilson, Jr., who is moving in material for a 9,500-ft. test located on the McCulloch lease, comprising about 60 acres of Lots 11, 12, 13, 14, 15 and 16 in Block 14, McCampbell Subdivision. Location is near the apex of the struction, and the well will attempt to test sand at intervals from 8,200-9,200 ft., which have shown heavy gas pressure in two deep tests that were drilled by Atlantic Refining Co.

SOUTHWEST TEXAS COMPLETIONS

Calhoun County

Wildcat: Coronado Corp. 6 Welder, dry, T.D. 6,098 ft.

Jim Wells County

Wade City field: Arkansas Fuel 2 Schreade, 86 bbl., 3/16-in. choke, T.D. 4,941 ft.
Lewis Production Co. 1 Stech, 76 bbl., 7/64-in. choke, T.D. 4,800 ft.

Nueces County

South Clara Driscoll field: Magnolia 4 Johnson, 48 bbl., ⅛-in. choke, perf. casing 5,548-60 ft., T.D. 5,655 ft.
Stratton field: Bay Tex Oil Corp. 4 Union Central Life Insurance Co., 173 bbl., ⅛-in. choke, perf. casing 6,500-10 ft., T.D. 6,805 ft.
Conroe Drilling Co. 2-B Sellers, 106 bbl., ⅛-in. choke, perf. casing 6,420-35 ft., T.D. 6,498 ft.
Southern Minerals Corp. 6 Stratton Community, 92 bbl., 3/32-in. choke, perf. casing 6,635-51 ft., T.D. 6,668 ft.
Wildcat: F. A. Gillespie & Sons, 1 D. W. Dabney, 116 bbl., ¼-in. choke, perf. casing 7,216-21 ft., T.D. 7,503 ft.
Henshaw Brothers 1 Dougherty, dry, T.D. 6,510 ft.
S. E. W. Oil Co. 2 Pfluger, 110 bbl., ¼-in. choke, perf. casing 6,997-7,012 ft., T.D. 7,143 ft.

LAREDO DISTRICT

Duval County

Charamousca field: Magnolia 2 Duval Co. Ranch Co., 35 bbl., ¼-in. choke, T.D. 1,559 ft.
Hoffman field: Gilcrease 2-B Salzar, 108 bbl., 18 hr., jetting, 3/16-in. choke, T.D. 2,638 ft.

Hidalgo County

Nichols field: Baldridge & King 2 Yturria Town & Imp. Co., 91 bbl., 5/32-in. choke, perf. casing 3,512-16 ft., T.D. 3,537 ft.
Samfordyce field: J. Messenger 2-A Chapa, dry, T.D. 3,434 ft.

(Continued on Page 69)

Forest City Basin

(Continued from Page 61)

Producers are looking for a pickup soon in the market for Nebraska crude. Evidence that plans were in the making to distribute the oil to numerous points in the state was seen in a request by the railroads for reduced "normal" rates to 18 points. Previously the state Railway Commission has made rates for refined petroleum products from Falls City and Salem effective to Omaha and Lincoln.

A mile and a quarter northwest of production at Falls City, Pioneer Drilling Co. was still working at 1 Hill-Hough, SE SW 6-1n-16e. The hole was below 2,000 ft., but operators were reported discussing plans for a test elsewhere and it was expected that the well would be abandoned fairly soon.

New Operation Starts at Falls City

Ohio Oil Co. 6 Sandrock, SW NW NE SE 20-1n-16e, in the Falls City pool, was drilling at 1,805 ft., having been delayed by a series of breakdowns. For several days this has been the only operation in the pool, but Johnson & Mitchell have begun building derrick ¾ mile southwest of production for 1 A. J. Burgner, NE SE NE 31-1n-16e.

Eight miles southwest of Omaha in Sarpy County, H. Hough et al 1 Pimm, S½ SW SE 15-13n-12e, was shut down at 350 ft. for 10-in. pipe. Kinderhook shale was topped at 312 ft., and there was a slight show of oil and gas at 335 ft.

In the Humboldt area, two tests were drilling—J. E. Palensky et al 1 Kalous, SW SW 5-2n-13e, 2 miles west of Humboldt, a tight hole drilling below 1,300 ft., and McNulty & Bass 1 Rose Cander, SW SW 15-2n-13e, 2 miles south of Humboldt, drilling below 1,040 ft. Both the tests are using rotary tools.

Three drilling wells are listed for Nemaha County. Frank Engles 1 A. R. Wheeler, NE NE NE 9-4n-14e, had the Hunton lime at 2,658 ft., and was drilling at 2,688 ft. with no shows. Bow & Arrow Co. 1 Schreifer, N½ NE SW 20-5n-14e, has been shut down for several weeks at a total depth of 1,792 ft. waiting for pipe. Bow & Arrow 1 Wrightsman, W½ SW NW 36-6n-14e, was underreaming 12-in. pipe at 800 ft.

NEBRASKA COMPLETIONS

Richardson County

Falls City pool: Harper Oil 4 Seibbernsen, SW NW NW 20-1-16, dry, T.D. 2,262 ft., Mississippi 1,907 ft., recovered 300 bbl. fluid, 90 per cent water, at 2,259 ft.
Skelly 4 Wallraff, SW NE SW 20-1-16, pumped, 216 bbl. 28 per cent water, Hunton 2,210-46 ft., T.D.

NEBRASKA DRILLING REPORT

Cass County

Golden Rod 1 Sporrer Brothers....SE SE SE 8-11n-13e
Mississippi lime 400 ft., Viola 1,020 ft., 5-in. 1,018 ft., Wilcox 1,329 ft., saturated cuttings, drilling 1,355 ft.

Nemaha County

Frank Engles 1 Wheeler.....NE NE NE 9-4n-14e
S.D. 2,745 ft.
Bow & Arrow 1 Wrightsman..W½ SW NW 36-6n-14e
Set 20-in. 110 ft., run 12-in. 800 ft.

Otoe County

Phelps 1 Patrick Roddy.....S½ SE SW 31-9n-14e
First report.

Richardson County

Pioneer 1 Hough-Hill.....C SE SW 6-1n-16e
Base Mississippi lime 2,288 ft., drilling 2,480 ft.
Palensky 1 Kalous.....C SW SW 5-2n-13e
Drilling 1,400 ft.

MISSOURI WILDCAT

Jackson 7 Rust 1 Hays.....C NE NE 22-66n-42w
Set 10-in. 117 ft.

IOWA WILDCAT

J. A. Johnson 1 Lucas.....SW NE SE 28-70n-43w
Set 10-in. 165 ft., Mississippi 855 ft., drilling 1,040 ft.

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FORD TRUCKS

AND COMMERCIAL CARS

Old Clinton Dry Hole Starts Deepening to Trenton Lime

By STAFF CORRESPONDENT

NEWARK, Ohio, Jan. 20.—A Geauga County test which has been shut down since November 1940, after finding the Clinton dry, is now drilling to the Trenton. East Ohio Gas Co. 1 G. W. Crile, Lot 1, Chardon Township, has resumed drilling after cementing a cave at 4,885 ft.

The sub-Trenton test of McCloy, Inc., in Jersey Township, Licking County, encountered water and is shut down at 4,360 ft.

Activity in the Danville area in Knox County continues with four gas wells being completed; 10 tests are now drilling in and about the village. Four oil wells, 15 gas wells, and 11 dry holes make up the Ohio completions.

In Columbiana County the test of the Natural Gas Co. of West Virginia on the William Tice farm, Section 19, Wayne Township, is drilling at 4,446 ft. with the Oriskany sand topped at 4,426 ft. and no increase in the gas volume reported of 200,000 cu. ft. a day. In Belmont County this company is drilling at 7,700 ft. in the test on the E. A. Mobley farm, Section 19, Smith Township, and has reached the red Clinton.

SUMMARY OF COMPLETIONS

Ohio

	No.	Prod.	Footage
Oil	4	57	1,926
Gas	15	*7.9	31,832
Dry	11	.....	21,267
Total	30	.....	55,025

*Million cu. ft.

Indiana

Oil wells	7	355	14,664
Dry holes	2	.....	2,743
Total	9	.....	17,407
Recompletions	7	500	.....

Eastern Kentucky

Gas wells	3	*8.3	7,085
Dry holes	2	.....	2,450
Total	5	.....	9,535

Western Kentucky

Oil wells	4	800	4,668
Dry holes	2	.....	2,669
Total	6	.....	7,337

Ashland County

Perry Township: Alleghany Development Co. 2 J. J. Harris, Sec. 17, dry, Berea, T.D. 756 ft.

Athens County

Ames Township: Orndoff 1 Ada Lafollet, Sec. 33, 700,000 cu. ft. gas, Berea, T.D. 1,214 ft.

Carthage Township: Cooper et al 1 Autmer Ackley, Sec. 16, 700,000 cu. ft. gas, Keener, T.D. 1,301 ft.

H. Hartley et al 1 F. Klingenberg, Frac. 24, 650,000 cu. ft. gas, Macksburg 800-ft. sand, 1,145 ft.

Rome Township: Wickens et al 1 F. Jackson, Sec. 17, 65,000 cu. ft. gas, stray, T.D. 725 ft.

Cook et al 6 M. B. Copeland, Frac. 36, 30,000 cu. ft. gas, Salt sand, T.D. 767 ft.

Guernsey County

Londonderry Township: Ohio Fuel 1 Thomas Hayhurst, Sec. 35, dry, Berea, T.D. 1,420 ft.

Jefferson County

Island Creek Township: Austin Sanders 1 J. S. McCoy, NE Sec. 19, dry, Berea, T.D. 1,535 ft.

Licking County

Eden Township: Ray Walters et al 1 Lester Nutter, Sec. 8, 500,000 cu. ft. gas, shot, Clinton, T.D. 2,811 ft.

Granville Township: J. S. Jones estate 1 fee, dry, no Clinton sand, T.D. 2,310 ft.

City of Newark: J. W. Hartshorn fee, 500,000 cu. ft. gas, shot, Clinton, T.D. 2,329 ft.

James McCloy 1 Peter Mike, 450,000 cu. ft. gas, shot, Clinton, T.D. 2,382 ft.

Dowler Oil Co. 1 Joseph Speck, dry, Clinton, T.D. 2,375 ft.

Knox County

Butler Township: Ohio Fuel 1 Jennie Morningstar, Sec. 14, dry, Clinton, T.D. 3,024 ft.

Union Township, village of Danville: H. E. Perkins 3 Charlotte Mickley, Sec. 5, 1,120,000 cu. ft. gas, Clinton, shot, T.D. 2,796 ft.

Ohio Fuel 1 Monica Smithhisler, Sec. 5, 500,000 cu. ft. gas, shot, Clinton, T.D. 2,808 ft.

Ohio Fuel 1 Elizabeth Miller, Sec. 18, 790,000 cu. ft. gas, shot, Clinton, T.D. 2,950 ft.

Lorain County

Grafton Township: Williams Prod. 3 William Gest, Lot 66, dry, Berea, T.D. 300 ft.

Medina County

Granger Township: T. R. Phillips et al 6 J. O. Crocker, Lot 25, Remson tract, 30 bbl., Berea grit, T.D. 478 ft.

T. R. Phillips et al 7 J. O. Crocker, 25 bbl., Berea grit, T.D. 500 ft.

J. O. Crocker 1 fee, Lot 25, 1 bbl., Berea grit, T.D. 460 ft.

J. O. Crocker 1 fee, Lot 25, 1 bbl., Berea grit, T.D. 468 ft.

Meigs County

Sutton Township: C. M. Parker et al 6 W. J. Krider, Sec. 23, deepened from Berea to Ohio shales, 50,000 cu. ft. gas, shot, T.D. 3,147 ft.

Tyree et al 5 H. M. Capehart, Sec. 30, deepened from Berea to Ohio shales, 600,000 cu. ft. gas, shot, T.D. 3,355 ft.

Muskingum County

Wayne Township: Atha 1 Perl Tom, Sec. 9, show gas, Clinton, shot, plugged, T.D. 3,958 ft.

Monroe County

Summit Township: C. E. Humphries et al 1 E. C. Schwallier, Sec. 1, 150,000 cu. ft. gas, Keener, T.D. 1,128 ft.

Noble County

Center Township: R. L. Smithberger 1 Earl Bates, Sec. 26, show gas, Berea, plugged, T.D. 1,560 ft.

Perry County

Reading Township: Ohio Fuel 1 Arthur Shaw, Sec. 2, dry, Clinton, T.D. 2,769 ft.

Summit County

Boston Township: William Dempsey 1 Shumaker-Schnabel Co., Lot 2, Sec. 1, 1,050,000 cu. ft. gas, Newburg, T.D. 2,974 ft.

Van Wert County

Harrison Township: Richey & Kunkle 2 George Hurless, Sec. 34, dry, Trenton, T.D. 1,260 ft.

INDIANA

EVANSVILLE, Ind., Jan. 20.—Indiana activity remained normal throughout the past week as seven oil wells and two dry holes were completed. The seven oil wells produced 355 bbl. initially, or an average of 51 bbl. per well. The majority of the activity during the week was concentrated in 10-5s-14w of Posey County, where Superior Oil Co. recompleted several old wells in the Waltersburg. These wells were deepened an average of 20-50 ft. and had an average initial production of 71 bbl. per well.

INDIANA COMPLETIONS

Daviess County

J. W. Cannon 5 Evans ..... SE SE NE 8-2n-5w
Pumped 14 bbl., natural, pay 597-613 ft., T.D. 613 ft.

Gibson County

Continental 21 Bozeman ..... SW SE NE 23-3s-14w
Pumped 200 bbl., natural, T.D. 3,008 ft., P.B. 2,843 ft.

Papoose 1 Cooper D ..... SW NE SE 5-2s-8w
Pumped 41 bbl., 20-qt. shot 2,115-19 ft., T.D. 2,968 ft., P.B. 2,854 ft.

Pike County

Murphy Oil 7 Stewart ..... NW NE NW 26-1n-8w
Dry. Sand 955-89 ft., no shows, T.D. 989 ft.

Schroeder & Hermann 1 Stroble ..... SW SW SW 34-1s-9w
Dry. Glen Dean 1,190 ft., Golconda 1,232 ft., Barlow 1,387 ft., Cypress 1,405 ft., Ste. Genevieve 1,547 ft., McClosky 1,618-29 ft. and 1,692-99 ft. (water), T.D. 1,754 ft.

Posey County

Harris Stewart et al 1 Reis ..... SE SW NE 1-7s-12w
Pumping, 40-qt. shot 1,766-77 ft., pay 1,174-1,219 ft., T.D. 1,219 ft.

Tide Water 3 Doll ..... SW SE SE 33-3s-14w
Pumped 40 bbl., 30-qt. shot 2,558-62 ft., T.D. 2,822 ft., P.B. 2,570 ft.

W. C. McBride 9 Swanders ..... SW NE NE 4-4s-14w
Pumped 20 bbl., 10-qt. shot 2,804-11 ft., T.D. 2,815 ft.

Superior 11 New Harmony ..... SE NW SW 10-5s-14w
Pumped 150 bbl., natural, base Waltersburg sand 2,225 ft., deepened from 2,185-2,232 ft.

Superior 16 New Harmony ..... SW SW SW 10-5s-14w
Pumped 50 bbl., natural, base Waltersburg 2,264 ft., deepened from 2,183-2,204 ft.

Superior 15 New Harmony ..... SW NE SW 10-5s-14w
Pumped 51 bbl., natural, base Waltersburg 2,225 ft., deepened from 2,204-2,226 ft.

Superior 14 New Harmony ..... SE SW SW 10-5s-14w
Pumped 52 bbl., natural, base Waltersburg 2,218 ft., deepened from 2,213-2,219 ft.

Superior 13 New Harmony ..... NW SE SW 10-5s-14w
Pumped 75 bbl., natural, base Waltersburg 2,222 ft., old well cleaned out.

Superior 12 New Harmony ..... NW SW SW 10-5s-14w
Pumped 75 bbl.:, natural, base Waltersburg 2,222 ft., old well cleaned out.

Superior 12 New Harmony ..... NW SW SW 10-5s-14w
Pumped 49 bbl., natural, base Waltersburg 2,206 ft., deepened from 2,170-2,206 ft.

Ripley County

O. Hughes 1 fee ..... NW NW SW 4-8n-10e
Location abandoned.

Vanderburg County

K. R. Bixby 5 Glaser ..... NW NW 31-5s-11w
Pumped 40 bbl., 140-qt. shot 1,174-1,219 ft., pay 1,174-1,219 ft., T.D. 1,219 ft.

INDIANA DRILLING REPORT

Crawford County

J. C. Barnett 1 Baylor ..... SE SE SW 22-1s-2e
S.D. 935 ft.

Gibson County

Hyslop et al 1 fee ..... NW NE NW 20-1s-9w
Drilling 1,227 ft.

Greene County

L. B. Jackson et al 1 Holmes ..... NW NW NW 22-7n-6w
T.D. 1,742 ft., P.B. 1,727 ft., waiting on cement.

Commonwealth 1 L. L. Tucker ..... NE SE NE 16-6n-6w
S.D. 1,775 ft.

Knox County

James Bohannan 1 Carle ..... SW SW SE 19-2n-10w
Machinery on ground, probably will not drill.

Monroe County

Terry Deskins 1 Thompson ..... NE NW SE 18-9n-1e
S.D. 850 ft.

Pike County

G. W. Miller 1 Nixon ..... SE SW NE 14-3s-8w
Old well drilled deeper, old T.D. 4,600 ft., straight reaming hole below 6-in. casing, 5-in. pulled.

F. J. Ellison 1 Caldmeyer ..... SW SW NE 11-3s-7w
Set 12-in. 20 ft., 10-in. 600 ft., 8-in. 965 ft., 6-in. 1,301 ft., shot water, S.D. 1,408 ft.

Posey County

Carter 1 Highman ..... SW SE SW 31-5s-13w
Rigging up rotary.

Basin Drlg. 1 Oakland City College NE NE SW 16-8s-14w
Menard 1,751 ft., Glen Dean 2,201 ft., Golconda 2,164 ft., drilling 2,200 ft.

McCummings et al 1 Oakland City College ..... NW NW SE 16-8s-14w
Rigging up rotary.

Ed Holman et al 1 Oeth ..... NE SE NE 6-4s-13w
Rigging up standard tools to drill out removable pipe 2,497-2,505 ft. and 2,626-50 ft., T.D. 2,981 ft.

Pulaski County

Ray McClure 1 Kocker ..... NW NW SW 23-30n-3w
Rig.

Spencer County

C. E. Dice 1 Larch ..... SW NW SW NW 12-6s-4w
S.D. 590 ft.

J. C. Ellis et al 1 Spence ..... SW NW SE 29-7s-6w
Drilling 1,050 ft.

Doris McPherson 1 Nichols ..... SW NW NW 10-8s-6w
Drilling 1,075 ft.

Sullivan County

E. M. Self 1 James Laod ..... NE NE NE 36-7n-9w
Location.

W. J. Reynolds 1 Poe ..... NE NE SW 3-8n-10w
Drilling 1,400 ft.

Vigo County

Sage & Farley 1 Campbell ..... S½ NE NW 24-11n-8w
Set 10-in. 630 ft., drilling 650 ft.

H. N. Oakley 1 Seibold ..... NW NW SW 18-3n-8w
T.D. 1,726 ft., P.B. 1,700 ft., S.D.

EASTERN KENTUCKY

ASHLAND, Ky., Jan. 20.—A middle-of-the-month roundup reveals the completion of three gas wells and the report of two dry holes, completed log in, with operations showing a slight increase in the eastern Kentucky fields. Several new locations have been reported and a number of wells are nearing "completion depth."

The usual year-end slump seems to have come to an end and local operators are keeping a close watch on the national-defense program awaiting a possible increased demand for oil and gas.

The W. O. Allen and W. W. McClure deep test on the Chism farm south of Ruckerville in Clark County has passed the 1,300-ft. mark and is a deep test with St. Peter sand as the objective.

Whitis & Sears completed 1 Varney at Road Fork in Pike County at 1,645 ft. in Maxon sand. The well is making 535,000 cu. ft. of gas daily.

J. Allen et al 1 Jeff Jervis, on Home Branch in Floyd County, 100,000 cu. ft. of gas in shale and Big lime at 2,701 ft.

T. A. Shewey et al 1 Dave Wallace, on Tug Fork in Martin County, 198,000 cu. ft. of gas in shale at 2,739 ft.

Jenkins et al report two dry holes in Morgan County

(Continued on Page 74)

Eastern Montana Gas Wells Lead in Revived Activity

By T. R. INGRAM

DENVER, Colo., Jan. 20.—Operations in the Rocky Mountain area showed an increase this week with 10 first reports, and 17 completions. Eight of the completions were gas wells in Montana.

Wyoming oil wells included two small pumpers in the Plunkett field in Fremont County for the Lincoln Oil & Gas Co. for 15 and 10 bbl., respectively, and a smaller well in Oscar B. Grace 3 Government at Kirby Creek. The dry and abandoned wells were Robinson & O'Donnell 1 State, Bailey district, Carbon County, and Sinclair-Wyoming 97-A in Lost Soldier. New operations included three in Lance Creek.

In Montana, Cut Bank had three completions in Texas Co. 8 State for 371 bbl., Steele Creek Oil 4 Carmen for 55 bbl., and Kately, agent, 3 Kramer for 212 bbl. Kevin-Sunburst had only one completion, a dry hole in A. A. Welch 2 Larum. The eight gas wells were scattered throughout the eastern part of the state, three being for the account of the Montana Gas Corp. and five for the Montana-Dakota Utilities Co.

COLORADO

Boulder County

Bartson Oil 1 Chenburg.....SW SW SE 15-2n-70w
Cemented 12½-in. at 65 ft.
J. A. Warren 3 Maxwell.....NW NE NW 24-1n-71w
Drilling 1,050 ft. in hard sandy shale.

El Paso County

F. F. Hintze 1 State, CEL SE SE 16-11s-60w, Ramah district, which has been shut down at 1,620 ft., after cementing 6⅝-in. at 1,550 ft., since last August, is preparing to resume.

Fremont County

U-Tex Oil 1 Hassler.....NE 28-20s-69w
T.D. 2,965 ft., testing est. 40 bbl. per day.

Huerfano County

Tomkins & Son 1 Two Pines .....SE SE 31-28s-69w
T.D. 365 ft., showing for 10 bbl. a day.

La Plata County

Nick Spatter 1-X Bryce.....SW SW 31-33n-9w
Drilling below 4,400 ft.

Larimer County

E. P. Gallup 1 Hanson.....C SE NW 36-10n-71w
Depth not reported, considerable water trouble.

Logan County

West Plains 1 Sheldon.....SE NW SW 3-10n-55w
Drilling 3,400 ft. in shale.

Moffat County

Mountain Fuel Supply 2-A Musser .....
CWL NW SE 4-11n-97w
Cemented 10¾-in. at 295 ft.

Park County

South Park Oil 1 Lamar.....NE NE SE 34-11s-75w
Drilling 7,687 ft. in sand.

Rio Blanco County

Texas-California 5 Unit.....NW NE NE 34-3n-94w
Drilling 5,950 ft.

Routt County

Mid-Colorado Pet. 1 Omholt.....NE NE SE 29-4n-87w
T.D. 3,160 ft., 2,600 ft. water in hole, cementing 6⅝-in.

SUMMARY OF COMPLETIONS

Wyoming

	No.	Prod.	Footage
Oil wells	3	28	926
Dry holes	2	.....	3,422
Total	5	.....	4,348

Montana

Oil wells	3	638	8,634
Gas wells	8	*35.9	9,713
Dry holes	1	.....	2,916
Total	12	.....	20,005

*Million cu. ft.

WYOMING

Big Horn County

McDonald & Curtis 1 Orchard.....SE NW 24-51n-93w
Drilling 1,465 ft., deep test, Torchlight field.

Carbon County

Robinson & O'Donnell 1 State, SW SW NE 16-26n-89w, Bailey district, was plugged and abandoned at 2,435 ft. It was found to be running low.

Ohio Oil Co. 2 Lundy, SE NE NW 34-20n-78w, outpost at Rock River, on northwest flank, was barren in the Muddy, Dakota, and Lakota, and may test Wall Creek before abandoning. It had the top of the Dakota at 4,127 ft., and the Lakota, which carried water, at 4,189-4,210 ft.

Crook County

Vickers-Continental 1 Duncan-Loban .....
NE NW SW 28-57n-64w
Drilling 2,342 ft. in lime, hole full of water.

Fremont County

Lincoln Oil & Gas Co. 12 Tribal, NE NW NE 26-1s-1e, Plunkett field, was completed in the Mowry shale at 238-43 ft., for 15 bbl. a day.

Same company's 13 Tribal, CEL NW NE 26-1s-1e, bailed 20 bbl. oil in 24 hours, with 2 bbl. of water, in the Mowry shale at 263 ft., total depth, and is a completion. It is estimated at 10 bbl. of oil a day.

Hot Springs County

Oscar B. Grace 3 Government, NW Lot 2 (NW NW NW) 21-43n-92w, Kirby Creek district, was completed in the Frontier at 410-20 ft., for 12 bbl. of fluid, of which 3 bbl. were oil, in 6½ hours on the pump. The 6⅝-in. was set at 392 ft.

J. W. Bales 1 Government....CWL NW SE 21-42n-90w
T.D. 972 ft., ran 10-in.

Natrona County

Royal Oil Corp. 1 Midert.....SW SW SW 26-35n-80w
Drilling 1,509 ft. in Steele shale.
Casper Creek Oil Co. 1 State SW SW SW 36-36n-81w
Drilling 2,100 ft., show gas at 2,010 ft.

Niobrara County

Drilling in Lance Creek in 1941 will be curtailed as far as possible and the schedule for the year is not yet quite definite. Between 20 and 40 wells will be drilled within the unit, depending upon adjustment of titles on the old placer claims on the east side and the number of offset locations on which drilling may be held in abeyance. A bill has been introduced in Congress authorizing the settlement of the title situation on the tracts in dispute with the Government.

Continental is going back into its 6 Otto Rohiff and deepen it from the Sundance to the Leo. It was completed in the Sundance in 1936 for 2,200 bbl. a day initial.

Park County

Resolute 2 State.....SW SW 16-57n-101w
T.D. 10,121 ft., recemented whipstock at 7,408 ft., redrilled to 7,954 ft. and S.D.

Platte County

Dividend O. & R. 1 Johnson.....NW SW 17-24n-66w
S.D. 3,814 ft. for casing.

Sublette County

Klumpe Syndicate 1.....NE SW NE 28-27n-113w
Drilling 1,100 ft.
Texas 1-C Government.....SW NW NW 24-27n-113w
Location.
Texas 1-J Government.....NW SW SW 27-27n-114w
Coring 985 ft.

Sweetwater County

Sinclair-Wyoming Oil Co. 97-A, NW NW SW 11-26n-90w, Lost Soldier field, was abandoned at 987 ft. in the Wall Creek, that horizon being barren. The field has had a prolific output from that horizon, but has about been exhausted.

Sinclair-Wyoming 95-A.....SW NW NW 11-26n-90w
T.D. 439 ft., running 13-in.
Rocky Mountain Drlg. 1 State SW SW SW 36-20n-104w
T.D. 3,974 ft., dry in Morrison and Sundance, will test Dakota.

Uinta County

Meridian Oil 2 Pat.....NW NW NE 26-13n-119w
T.D. 1,015 ft., trying to shut off water with 6¼-in. and test show oil at 1,012 ft.

Weston County

Lanam-Crowley Oil Co. 1.....SW SW NW 8-46n-63w
Drilling 615 ft. in shale, 6⅝-in. at 610 ft.

MONTANA

Big Horn County

Big Horn Oil & Gas 44.....NW SE NE 16-1s-33e
Drilling 640 ft., first report. Hardin district.

Blaine County

Montana Gas Corp. 1 Columbian, SW NE SW 10-31n-19e, Bowes field, was completed in the Eagle sand at 949-1,024 ft. for 3,900,000 cu. ft. a day with a rock pressure of 204 lb.

Same company's 1 Sias, SE SE SW 4-31n-19e, was completed for 5,500,000 cu. ft. in the Eagle sand at 1,108-88 ft. Rock pressure was 201 lb. The 6⅝-in. was set at 1,105 ft.

Same company's 2 Guertzgen, SE SE NW 35-32n-19e, was completed for 22,700,000 cu. ft., with a closed-in pressure of 175 lb., in the Eagle sand at 690-760 ft.

Montana Gas 2 Bjornsen.....SE NE NW 34-32n-19e
Cemented 8¼-in. at 765 ft., first report.

Cascade County

Bushford Pet. Synd. 1 Shannon-Roberts .....
C SW NE 12-20n-1e
Drilling 3,190 ft., Vaughn district.

Daniels County

Copan O. & G. 2 Wiley.....NW NW NW 10-36n-50e
T.D. 1,928 ft., ready to resume drilling with rotary.

Fallon County

Montana-Dakota Utilities 147, C SW NE 19-4n-62e, Cedar Creek gas field, was completed at 1,660 ft. for 260,000 cu. ft. from the Eagle sand at 1,246-1,660 ft. The 5½-in. was set at 1,223 ft. and 451 ft. of perforated 4½-in. was run to bottom.

Same company's 148, C NE SW 17-4n-62w, was completed in the Eagle sand at 1,190-1,500 ft. for 486,000 cu. ft. with a pressure of 416 lb., through 329 ft. of perforated 4½-in. landed on bottom.

Fergus County

Hess & Tony 1 State.....CWL SW NE 36-22n-17e
Cemented 7-in. at 414 ft.

Glacier County

Texas Co. had another large well on its lease in South Cut Bank in its 8 State, C NE SW 16-32n-5w, which swabbed 371 bbl. first 23 hours at 2,930 ft., total depth, from the Cut Bank sand at 2,855-2,914 ft. Main pay was at 2,895-2,912 ft., oil rising 2,250 ft. in the hole.

Steele Creek Oil Co. 4 Carmen, SW SW NE 19-34n-5w, swabbed 55 bbl. first 24 hours at 2,788 ft., total depth, from the Cut Bank sand at 2,720-84 ft. Main pay was at 2,770-84 ft.

Kately, agent, 3 Kramer, NE SE NW 15-34n-6w, was completed at 2,916 ft., total depth, and swabbed 212 bbl. first 20 hours from the Cut Bank at 2,875-2,913 ft., the main pay being at 2,900-13 ft.

Phillips County

Montana-Dakota Utilities 619, C SW SW 3-32n-33e, Bowdoin gas field, was completed at 1,045 ft. for 785,000 cu. ft. The Bowdoin sand was at 735-80 ft. and the Phillips sand at 840-980 ft.

Same company's 620, C SW SW 1-32n-33e, made 560,000 cu. ft. initial from the Bowdoin sand at 739-830 ft. and the Phillips sand at 985-94 ft.

Montana-Dakota 623.....C NW NE 34-32n-33e
Cemented 5½-in. at 701 ft., first report.

Toole County

Frank P. Walsh 1 Mowat, SW NW SE 7-33n-2e, in the Devon district, was completed in the Madison lime at 1,642 ft., total depth, for 1,750,000 cu. ft. of gas with a pressure of 90 lb. Rig was moved to the northeast for 2 Mowat.

In Kevin-Sunburst the only completion was Aaron A. Welch 2 Lerum, SE SW NW 25-36n-2w, which was dry and abandoned at 1,658 ft. It had the contact at 1,641 ft.

UTAH

Box Elder County

Northern Oil 1.....NE SW 17-13n-4w
Resumed at 386 ft. and drilling ahead at 475 ft.

Grand County

Cane Creek Oil Co. 2 Shaffer, NW SW SW 31-26s-
(Continued on Page 69)

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Announcement of Second Well Increases La Ward Interest

By NEIL WILLIAMS

HOUSTON, Tex., Jan. 20.—The announcement of a new location in the La Ward area, Jackson County, has attracted additional attention to this district which has been in the limelight of Gulf Coast operations for the past several weeks as result of favorable showings in a wildcat that is now being tested by the Humble Oil & Refining Co. The prospective pool opener is 1 A. A. Egg located in the B. J. White Survey, about 6½ miles northeast of La Ward. Casing was cemented the previous week to test a sand section in the Frio formation at 5,259-95 ft., and at the close of the week, preparations were being made to retest after the well showed salt water when tested at 5,259-95 ft. The new location is the company's 1-B Mauritz Brothers, located about 1 mile southeast of the present well in the B. J. White Survey.

In the same county, and located as an outpost well in the Mauritz field, Boyle, Coffey & Wright 1 Mauritz is coring in shaly sand below 5,642 ft. The Discorbis was topped at 4,641 ft., Heterostegina at 4,855 ft., Flat Marginulina at 5,130 ft., and the Frio at 5,170 ft. Seven feet of sand with an oil odor was recovered in a core at 5,449-57 ft., and a drill-stem test was attempted, but the test failed when the seat of the testing tool slipped.

Humble Oil & Refining Co. is attempting to open production from a new sand on the north side of the Rowan field, Brazoria County, as testing continues at 3 Hubbard. The well was drilled to a total depth of 9,600 ft., and 5½-in. casing was cemented at 9,434 ft. The first test at 9,397-9,401 ft., recovered salt water, and another test is expected to be made before plugging back and completing in the 8,500-ft. discovery pay which logged about normal with 1 and 2 Hubbard located southeast and southwest respectively.

Colorado County Wilcox Test

W. R. Davis Co., Inc. 1 Brownston located in the Garwood area, Colorado County, has been killed and the company is scheduled to retest in another sand section in the Wilcox formation. The well flowed an unestimated amount of gas and distillate when tested at 9,423-35 ft., but is reported to have started making considerable brackish water which resulted in the well being killed.

In the Red Fish Reef field, offshore from Chambers County in Galveston Bay, Humble 8-A-223 State, 1 mile northwest of the discovery well is bottomed at 10,364 ft., and the company is cutting sidewall cores. Only slight showings are reported to have been logged in the 10,000-ft. section. Approximately 1 mile northwest of 3-A-248 State, drilling continues below 9,000 ft. in 10-A 249 State, after topping the Marg'nulina at 7,900 ft., and the Frio at 8,635 ft.

George Echols has announced foot measurements on 2 E. W. Boyt, a projected deep test which will be drilled in the Double Gum area, Liberty County. The well is situated 467 ft. from the north line and 2,580 ft. from the west line of the H.&T.C. Survey No. 9. The operator's first test cored several interesting showings in the Frio sand, but due to mechanical trouble, no successful test was ever made.

In Harris County and located in the Cypress area, George Echols 1 Ed. C. Smith is drilling in shale below 6,000 ft. This is a projected Wilcox test being located about 1 mile northeast of Gulf 1 Roberts, a dry hole which logged interesting showings. The Smith well topped the Massilina Pratti at 4,971-5,001 ft., Hockleyensis at 5,121-49 ft., Dibollensis at 5,920-58 ft., and the Camerina at 5,978-6,007 ft.

In the League City field, Galveston County, and located on the north edge of the field, Phillips Petroleum Co., was preparing to test 1 C. J. Herrick. The hole is bottomed at 11,015 ft., and 7-in. liner was cemented on bottom. This is the deepest test ever drilled in the field and a test will be made of new sand sections below 10,000 ft. which are known to be present, but due to excessive gas pressure, no successful test was ever made.

The first of several wildcats which are expected to be drilled in search of shallow Frio sand production following the discovery of the Dyersdale field was announced for Harris County. H. C. Cockburn staked location for 1 L. A. Weiss 3 miles east of the Dyersdale field in the W. H. Steel Survey. In the Sheldon area and located in the Victor Blanco Survey, O. J. McCullough et al will drill 1 Swilley in Lot 4. Both tests will be drilled to a depth of 4,500 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Dyersdale	4	1,870	17,398
Other fields	12	3,951	174,591
Gas wells: Fields:	2	.....	9,915
Dry holes: Fields	3	.....	18,525
Total	21	.....	220,429

TEXAS GULF COAST COMPLETIONS

Brazoria County

Chocolate Bayou field: Phillips 1 Houston Farm Development Co., 283 bbl. distillate and 13 bbl. salt water, ¼-in. and 3/32-in. chokes, perf. casing 9,675-77 ft., T.D. 10,006 ft.

West Columbia field: Hogg Oil Co. 1-A Hogg, 77 bbl., 5/32-in. choke, perf. casing 4,550-75 ft., T.D. 6,279 ft.

Chambers County

Seabreeze field: Sun 4 Hoffman, 525 bbl., 7/64-in. choke, top sand 8,498 ft., T.D. 8,516 ft.

Galveston County

Alta Loma field: Stanolind 3 Hulen, 374 bbl., ⅛-in. choke, perf. liner 9,166-72 ft., T.D. 9,175 ft.

Harris County

Dyersdale field: H. C. Cockburn 8 Burkett, 525 bbl., ¼-in. choke, perf. casing 4,068-78 ft., T.D. 4,100 ft.
H. C. Cockburn 7 Burkett, 410 bbl., ¼-in. choke, perf. casing 4,058-68 ft., T.D. 4,098 ft.
H. C. Cockburn 15 Burkett, 410 bbl., ¼-in. choke, perf. casing 4,064-74 ft., T.D. 4,099 ft.
H. C. Cockburn 18 Burnett, 525 bbl., ¼-in. choke, perf. casing 4,042-57 ft., T.D. 4,101 ft.
H. C. Cockburn 1-A Burkett, gas well, perf. casing 3,468-78 ft., T.D. 4,100 ft.

Tomball field: Humble 6 Petrich, 506 bbl., ¼-in. choke, top sand 5,563 ft., T.D. 5,568 ft.

Jackson County

Lolita field: Humble 7-A L. Ranch, 22 bbl. an hour, ¼-in. choke, sand 5,926-29 ft., T.D.
Magnolia 2 J. H. Hamilton, 110 bbl., ⅛-in. choke, sand 5,038-41 ft., T.D.

West Ranch field: Humble 14-A Toney, gas well, perf. casing 5,709-17 ft., T.D. 5,815 ft.
Magnolia 124-A West Ranch, 561 bbl., ¼-in. choke, perf. casing 5118-26 ft., T.D. 5,127 ft.

Jefferson County

South China field: Titanic Oil Co. 1 Weed, dry, T.D. 8,006 ft.

Liberty County

Hardin field: Texas 5 Humphrey, 344 bbl., ¼-in. choke, top sand 7,639 ft., T.D. 7,657 ft.

Esperson field: W. P. Luse 4 Hlavaty, 493 bbl., ¼-in. choke, top sand 6,459 ft., T.D. 6,527 ft.

Matagorda County

Blessing field: Texas 1 Tyson, 125 bbl. distillate, perf. casing 8,275-8,310 ft., T.D. 8,327 ft.

Wharton County

Magnet field: Humble 31 Cockburn, 29 bbl., 7/64-in. choke, top sand 5,537 ft., T.D. 5,539 ft.

Pickett Ridge field: Gilcrease 2-A Kubela, dry, T.D. 4,729 ft.

Withers field: Texas 88-C Pierce, dry, T.D. 5,900 ft.

TEXAS GULF COAST DRILLING REPORT

Brazoria County

Phillips 1 Triangle Development Co., 1 mile east of production, Chocolate Bayou field, H.T.&B. Sur., drilling shale and sand 10,038 ft.

Rowan & Nichols Oil Co. 1 T. H. Mattingly, southeast of Manvel field, H.T.&B. Sur. No. 5, drilling 210 ft.

J. Newton Raynor 1 J. W. Christian, Chenango area, William Parker Sur., drilling shale 9,116 ft.

Strake 1 Griffith, southwest of Alta Loma field, H. P. Cayce Sur., drilling shale 9,957 ft.

Matagorda County

Cities Service Oil Co. 1 Duffy, Blessing area, J. W. E. Wallace Sur., drilling shale 1,608 ft.

Continental 1 Biorn, east of Markham field, dry, T.D. 8,418 ft.

Stanolind 1 Huebner, E. Hall Sur., building road.

Grimes County

R. A. Irwin et al 1 South Texas Development Co., R. O. Lusk Sur., drilling shale 4,198 ft.

Montgomery County

Superior 1 T. A. McWhorter, Magnolia area, T. J. Nichols Sur., S.D. 9,341 ft.

Washington County

John A. Deering 1 H. C. Buck, James Lynch Sur., drilling shale 5,792 ft.

Rocky Mountain Area

(Continued from Page 67)

21e, Cane Creek field, which has been shut down at 3,260 ft., will be completed to the objective horizon which was found in the old Midwest discovery at 3,640 ft., by the Cal-Ute Oil Co., a California corporation, which was given a permit by the California corporation commissioner December 24. It will receive therefor 2,560 acres adjacent to the well. The well had a water sand at 3,005 ft., which flowed about 15 bbl. over the collar of the 8⅝-in. It then drilled in wet hole to between 3,135-80 ft. when oil and gas began to show through the water under about 1,500 lb. pressure. The tools were hung up while attempt was made to cement in a string of 6⅝-in. After a cement job and five squeeze jobs over a 2-month period, the well was shut down until financing of further operations were completed.

Southwest Texas Fields

(Continued from Page 62)

Jim Hogg County

Colorado field: Humble 5-B King, 160 bbl., 3/16-in. choke, T.D. 2,925 ft.
V. F. Neuhaus 2-D Trevino, 125 bbl., 1-in. choke, T.D. 2,970 ft.

Kelsey field: Humble 22 Bass, 68 bbl., 7/64-in. choke, T.D. 4,756 ft.
Humble 57 McGill, 71 bbl., 7/64-in. choke, T.D. 4,744 ft.

Live Oak County

Mountain View field: Sal Vieja Oil Co. 2 Riser, dry, T.D. 2,912 ft.

White Creek field: Bryan Patterson 1-A Kibbler, dry, T.D. 1,441 ft.

McMullen County

San Jose field: E. E. Sorey 2 Kountze, dry, T.D. 1,181 ft.

Starr County

Rincon field: Continental 40-B Slick, 85 bbl., 3/16-in. choke, perf. casing 3,723-40 ft., T.D. 4,251 ft.
Continental 41-B Slick, 145 bbl., 3/16-in. choke, perf. casing 3,723-40 ft., T.D. 4,130 ft.

Webb County

Wildcat: Seaboard 2 Newton, dry, T.D. 1,829 ft.

Zapata County

Wildcat: Yehudi et al 1 Cuellar, dry, T.D. 2,063 ft.

SAN ANTONIO DISTRICT

Bexar County

Gas Ridge field: Southwest Drilling Co. 7 Covell, 2 bbl., pumping, T.D. 425 ft.

Frio County

Pearsall field: Texas Atlas 6 Cory & McWilliams, 331 bbl., 3/16-in. choke, T.D. 5,611 ft.

Guadalupe County

Darst Creek field: Bruce Albright 2 Pisey, 42 bbl., oil and 13 bbl., sulfur water, pumping, T.D. 2,613 ft., sand 800-32 ft.

Elm Creek field: P. G. Rouse 5 Lenz, 7 bbl., pumping, T.D. 842 ft.

Lee County

Wildcat: Marts & Beaven 1 J. C. Lawrence, dry, T.D. 2,093 ft.

Medina County

Wildcat: J. P. Oakes 1 Nientenhoefer, dry, T.D. 1,410 ft.

Milam County

Wildcat: W. S. Shadrack 1 Donaldson, dry, T.D. 465 ft.

SOUTHWEST TEXAS DRILLING REPORT

Aransas County

Continental 3 St. Charles, St. Charles field, drilling shale 11,260 ft.

Humble 1 St. Charles Bay, drilling shale 8,670 ft.

Atascosa County

Henderson Coquat 1 Beshears, J. S. Loving Sur., drilling shale 1,810 ft.

De Witt County

Atlantic 1 Zenger'e, Thomaston field, Charles Lockhart Sur., top Wilcox 7,730-40 ft., drilling shale 8,050 ft.

Duval County

Smith & Story 1 Sutherland, Sur. 188, drilling shale 2,562 ft.

Goliad County

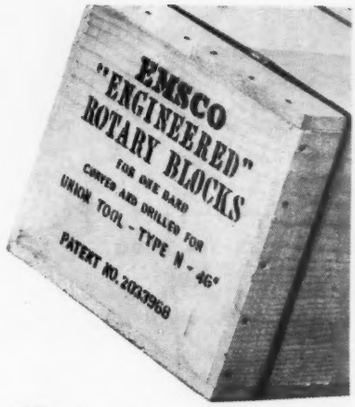
W. R. Davis Co. Inc. 1 Webb, outpost test in Wesar area, coring shale 6,183 ft.

Kleberg County

Skelly 1-589 State, Baffin Bay field, drilling shale 7,555 ft.

Lee County

Humble 1 Meide, L. P. Rucker Sur., drilling shale 6,-002 ft.



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Among the Drilling

ALLEN & MORRIS, San Antonio, Tex., received contract for a new operation in the East White Point field, San Patricio County, Southwest Texas, from W. R. R. Oil Co. In the new Willamar field, Willacy County, Texas, drilling continues below 7,900 ft. in Pan American Production Co. 1-B Willamar Community, located about 1,100 ft. southeast of the discovery well.

PIONEER Drilling Co., Tulsa, is drilling a wildcat with cable tools 1¼ miles northwest of Falls City production in southeastern Nebraska. It is 1 Hill-Hough in SE SW 6-1n-16e.

JOCK GARDEN has been awarded contract by Johnson & Mitchell for a well in the Falls City pool of southeastern Nebraska, 1 A. J. Burgner, NE SE NE 31-1n-16e. For several weeks there has been only one operation in the pool.

RED IRON Drilling Co., Marshall, Tex., has spudded a relief well to the Bobby Manziel 1 Lee Bell, junked gasser ¾ mile northwest of Hawkins, Wood County, East Texas. The 1 Bell was killed last week but ground around the well continued to sink and because of fear of its cratering the relief well is being drilled. Location of the relief well is 350 ft. east of 1 Bell, being changed from the site ordered by the Railroad Commission, which was 441 ft. from the north and 617 ft. from east lines of the lease.

WIEGAND BROTHERS, San Antonio, Tex., have spudded a new operation in the Tinney Creek field, Caldwell County, Texas. The well is 1 de Vaughn and will be drilled to a depth of 2,500 ft.

BANCROFT Drilling Co., San Antonio, Tex., is starting a new operation in the Hoffman field, Duval County, Southwest Texas, for Gilcrease Oil Co.

GEORGE B. BARHAM, drilling contractor of Monahans, Tex., last Saturday entertained some 900 persons at his annual barbecue honoring employes of various oil companies. The barbecue was held at Monahans with Tex Parks, superintendent for Mr. Barham, in charge of arrangements.

HARVEY Drilling Co., Wichita Falls, Tex., completed his 2 H. Sicking 3 miles south of Muenster, in Cooke County, Texas, last week for 55 bbl. in 4 hours, pumping, at a depth of 1,281-86 ft. The 3 Sicking was also completed by the operator for a 35-bbl. pumper at 1,283-87 ft. Locations of the wells are in the Hinkle Survey, Abstract 494.

HELMERICH & PAYNE, Tulsa, has been awarded the contract to drill a wildcat test 2 miles east of Wellington in eastern Sumner County, Kansas, for Trees Oil Co., Winfield, Kans.

KEPLEY Drilling Co., Corpus Christi, Tex., is preparing to spud a new operation in the Pearsall field of Frio County, Texas, for the Texas Atlas Oil Corp.

ARNOLD & THOMAS, Kingsville, Tex., are moving a rotary 3 miles northwest of Three Rivers in Live Oak County, Southwest Texas, for Brauer et al 1 Atkinson, a wildcat located in the Louis Ayers Survey.

ARROW Drilling Co., Tulsa, contractor on Oklahoma's first discovery well in 1941, the Selden Henry 1 Dudgeon, NE SW SE 36-12-9, north of Okemah in Okfuskee County, also holds an interest in the lease block on which the well is located. They have made application for 10-acre spacing in the new pool and have been granted a hearing January 28.

ATLAS Drilling Co. is spudding a well for Hugh H. Heinig in Forest Township of Genesee County, Michigan. The well, 1 Dodge, is located in SE SW SW 5-9n-8w.

CARTER & RUBSAMEN, San Antonio, Tex., have moved a rotary to Starr County, Texas, where contract was received from Arkansas Fuel Oil Co. 1 F. Martinez, a wildcat located about 1 mile southeast of the North Rincon field. Contract depth is 5,600 ft.

W. R. QUINN has started drilling operation on Earl Rowe 1 McBride, a wildcat located about 3 miles west of Skidmore in Bee County, Texas.

TOM BERRY, Tulsa, in a well of his own, is getting his first production in the East Stroud pool of Creek County, Oklahoma, at 1 Linihan, SE NE NE 31-15-7e. The well was showing 8½ bbl. of oil an hour with 1,000,000 cu. ft. of gas a day.

GEORGE ECHOLS is drilling below 6,600 ft. in his 1 E. C. Smith, a projected Wilcox test located in the Cypress area of Harris County, Texas Gulf Coast. In the meantime,

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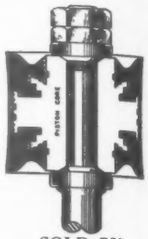

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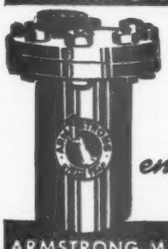

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location was announced for a deep test to be drilled in the Double Gum area, Liberty County, Texas. In Jefferson County, Texas, and located in the Westwego area, drilling continues below 9,916 ft.

C. W. JONES, drilling contractor of West Branch, Mich., is drilling below 2,200 ft. at United Drillers & Producers 1 Kircher in Monitor Township of Bay County, Michigan. Location of the well is in SW NE NE 3-14n-4e.

PARKER Drilling Co., Houston, Tex., has started drilling operations on Hall-Jordan Oil Co. et al 2-71 State, located about 1 mile offshore from Jefferson County, Texas, in the Gulf of Mexico.

FRANK PHELPS, McPherson, Kans., has been awarded contract to drill a wildcat in Otoe County in southeastern Nebraska, 3 miles northeast of Nebraska City, another deep test for the Forest City basin. The test lies east of the Nemaha granite ridge and is in 31-9n-14e, but exact location has not yet been reported from the field.

R. A. WELLS is building rig for the Vic Wilson 1 Douglas, in NE SE SE 33-11n-2w, Emerson Township, Michigan. The test is north of Wilson's first gas tests in North Star Township.

McDANNALD Oil Co., Houston, Tex., has started drilling operations on the company's projected Wilcox test, 1 Foster Lumber Co., located in the Cold Springs area of San Jacinto County, Texas. In the meantime, drilling was expected to be started shortly on a new well in the Port Barre field of St. Landry Parish, Louisiana, following completion of 3 Futral which is believed to have opened a new producing horizon for the field.

GARETSON & KNISELY are contractors for one of two test wells in the Humboldt area of Nebraska, J. E. Palensky et al 1 Kalous, SW SW 5-2n-13e, 2 miles west of Humboldt. The other well in the area is being drilled by Clyde Pulse. It is McNulty & Bass 1 Rose Cander, C SW SW 15-2n-13e.

CROSBY Drilling Co., of Houston, Tex., is expected to make a production test of M. McMurray 1 Allen, a prospective Wilcox sand pool opener located east of Halletsville in Lavaca County, Texas. Casing was cemented at 8,522 ft. several weeks ago but testing has been delayed due to unfavorable weather conditions.

NOBLE Drilling Co., Houston, Tex., completed another producer in the Alta Loma field of Galveston County, Texas, for Stanolind Oil & Gas Co., and the rotary is expected to be moved to a new location.

LUPHER Drilling Co., Mount Pleasant, Mich., in the Freeman area of Clare County, Michigan, has built derrick for Pure Oil Co. 1-A State-Freeman. Location of the well is C N½ SW NE 1-18n-6w. In the Winterfield area of Clare County, the contractor was drilling below 1,950 ft. at Pure Oil Co. 1 Swindlehurst, in C E½ NE NW 32-20n-6w. In the Broomfield area of Isabella County, Michigan, the contractor is drilling below 1,660 ft. at Pure Oil Co. 7-B Embry, located in C S½ S½ NW 4-14n-6w.

HARRY MORGAN, at the Love Petroleum Co. 1 Childress unit in the Tinsley field of Yazoo County, Mississippi, is shut down at 4,909 ft., waiting on cement after setting the oil string. The well, located in SE 19-10n-2w, topped the chalk at 4,812 ft. and recovered 96 ft. of oil sand.

JACK COX, Owensboro, Ky., is rigging up for the Hank Riddle, John McKeel 1 Adair, a 2,200-ft. Ordovician test in Graves County, Kentucky. The 1 Adair, a cable-tool test, is located about 33 miles from Paducah, on the east edge of the town of Farmington.

HINKLE Drilling Co. of Effingham, Ill., last week completed its 1-B Townsite in the Effingham pool for a small pumper. Located in NW SW NE 22-6n-5e, the well topped the McClosky pay at 2,503 ft. and after acidizing with 500 gal. pumped 10 bbl. per hour.

HAWKINS & HOWELL are shut down for orders at the British American Oil Co. 1 Houston in Sharkey County, Mississippi. Located in NE SW 23-11n-7w, the 1 Houston topped the Eutaw at 3,282 ft. and Tuscaloosa at 3,283 ft. Carried to 4,027 ft. in red beds, the pipe was stuck and after recovering the stem, hole was sidetracked and drilled to 1,310 ft.

REX Drilling Co. at last reports was drilling in shells and lignite below 3,590 ft. at Union Producing Co. and Texas Co. 1-A W. G. Childress in the Tinsley field of Yazoo County, Mississippi. Location of the 1 Childress is NE SW 24-10n-3w.

Earl Hollandsworth (right), of Hollandsworth Drilling Co., Longview, Tex., and crew on the derrick floor of his 1 Robbin in the townsite area of the Hawkins pool of East Texas. The 1 Robbin is just east of the Rotondi 1 Cobb, discovery well in the townsite. The 1 Robbin last week was completed for a Railroad Commission gage of 197 bbl. in 2 hours through ½-in. choke on 2-in. tubing

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By

L. P. STOCKMAN

Gas Field in San Joaquin Co. Is First Discovery of Year

LOS ANGELES, Calif., Jan. 20.—Discovery of a new commercial gas field in the Vernales district of San Joaquin Valley and the coring of 78 ft. of good looking oil sand in 1 Lechler of Western Gulf Oil Co. in the Newhall-Castaic district in southern California were of outstanding importance in California during the past week. Other outstanding developments included an extension of the proved limits of the Kettleman North Dome field as far as Eocene production is concerned, the establishment of new deep drilling records in the Dominguez and Long Beach fields, the coring of oil sand by Wilshire Oil Co. in an outpost well at Rio Bravo and the formal starting of conferences to work out a plan for development of the Paloma distillate field. Several new wildcats have already been started since the advent of the new year and, from present indications, exploration work during 1941 will be of an aggressive nature. Removal of the Paloma field from the list of fields producing crude oil and its reclassification as a distillate field will not exert any great effect on crude-oil reserves as most estimates only gave this field a small ultimate due to the limited data available.

Vernales Gas Field

Standard Oil Co. confirms opinions that it had discovered a new gas field in San Joaquin County by completing 1 Blewett Community in 25-3s-6e flowing 10,000,000 cu. ft. of dry gas per day from 3,872-73 ft. This new well which opened up a new gas field about 7 miles southeast of the Tracy gas field is producing from 32 ft. of formation. The producing zone is probably the Emigh and its proximity to the Tracy gas field indicates that the formations encountered should be similar. The Tracy gas field produces from the Cretaceous as do most other gas fields in the north central part of the state. Standard Oil Co. did not have as good luck in Yolo County as 2-1 Tippetts in 9-12n-3w showed salt water at 3,138-3,240 ft. and may be abandoned.

Oak Canyon

Western Gulf Oil Co. appears to have discovered a new oil field in Oak Canyon although this will not be definitely determined until a production test is made. No. 1 Lechler in 31-5n-17w logged 78 ft. of Modelo oil sand at 2,290-2,390 ft. and on a formation test flowed 14 bbl. per hour of relatively clean 22.9-gravity oil and at a daily rate of 740,000 cu. ft. of gas. Elevation is 1,413 ft. Bottom of the hole is 2,442 ft. The first plug put in the bottom of the hole failed to set but the second appears to have held in good shape. Officials of Western Gulf are not any too sure the company will be able to finish a flowing well but feel that there is sufficient oil sand to make a pumping well at least. No. 1 Lechler is located in the Newhall-Castaic region and is located on the south flank of the Halsey anticline. The finding of Modelo formation of upper Miocene age at this shallow depth was to be expected as the Modelo thins to the west and outcrops at the surface in Ventura County. The Modelo was found in R. E. Havenstrite 1 Lincoln around 5,000 ft. which indicates a very decided rise in the Modelo between the two locations.

SAN JOAQUIN VALLEY

R. S. Lytle who is developing several properties for former stockholders of Petroleum Securities Co. which has been dissolved this week extended the limits of the Kettleman North Dome field for Eocene production by completing 5 Felix in 35-21s-17w flowing 710 bbl. of clean 47.3-gravity oil and 24,000,000 cu. ft. of gas daily from 10,872 ft. This is a typical Eocene completion, the characteristics being an extremely high gas-oil ratio and large volume of natural gas. This well is located within the outer line established several years ago during organization of the Kettleman North Dome Association which enclosed the area considered to be proved for Temblor production. No. 5 Felix is located out on the north flank of the Kettleman structure and will probably lead to offset drilling by Tide Water Associated Oil Co. on the Whepley property and by Shell Oil Co., Inc., on the Dixon lease.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: San Joaquin Valley	4	3,380	36,473
Coastal district	1	25	1,705
Los Angeles Basin	15	3,592	75,867
Gas wells: San Joaquin Valley	1	*10	3,872
Los Angeles Basin	1	*1	2,525
Dry holes: San Joaquin Valley	4	.....	18,070
Total	26	.....	138,512

*Million cu. ft.

Rio Bravo District

Wilshire Oil Co. has found oil in the Vedder sand in No. 1 Campen in 1-29s-25e a wildcat located southeast of the Rio Bravo field in Kern County and 11,366 ft. and a 7-in. water string has been cemented at that depth. Bottom of the hole is 11,390 ft. and all indications point to the probability that a good well will reward the company for its efforts. The derrick for this well was erected in August 1939 but the company did not move in with rotary drilling equipment until late in 1940. No. 1 Campen is located 1,155 ft. north and 990 ft. west of the southeast corner of 1-29s-25e which places the well about midway between the Rio Bravo and Greeley fields. The southern end of the Rio Bravo field appears to be fairly well defined by the results of production although no dry hole has actually been drilled to definitely define the limits.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Northeast Field

Amerada 24-20 Ewing 20-19s-16e
Flowed 620 bbl., 26.7-gravity, 1 per cent cut, 275,000 cu. ft. gas, 20/64-in. bean. Pressures 800/900 lb. Elev. 720 ft. T.D. 8,194 ft. 5½-in. combination string 8,194 ft. Perf. 8,175-85 ft. 8,076 ft. 2½-in. tubing. Completed in Gatchell (Eocene) age. 32 days from spud to completion. Top Kreyenhagen 7,105 ft., green sand 8,110 ft., Gatchell 8,167 ft. Fresno County.

Coalinga Southeast Field

Superior 7-B Cagle 6-20s-16e
Flowed 1,575 bbl., 28.7-gravity, 0.3 per cent cut, 990,000 cu. ft. gas. 32/64-in. bean. Pressures 1,200/1,250 lb. Elev. 759 ft. T.D. 8,047 ft. 8⅝-in. water string 7,564 ft., 503 ft. 6⅝-in. liner 8,047 ft. Perf. 7,585-8,047 ft., 7,820 ft. 2½-in. tubing. Completed in Gatchell (Eocene). 45 days from spud to completion. Top Kreyenhagen 6,260 ft., Gatchell 7,564 ft. Base Gatchell 8,032 ft. Bottomed in silt. Fresno County.

Coles Levee Field

Richfield 47-4-B Kern County Land 4-31s-25e
Flowed 475 bbl., 55.4-gravity, 3 per cent cut, 7,000,000 cu. ft. gas. Two 1½-in. beans. Pressures 350/1,100 lb. Elev. 307 ft. T.D. 9,360 ft. 8⅝-in. water string 8,452 ft. 933 ft. 6⅝-in. liner 9,355 ft. Perf. 8,507-8,620 ft., 8,720-8,951 ft., 8,995-9,131 ft., 9,175-9,355 ft. 9,327 ft. 2½-in. tubing. Completed in Stevens. 71 days from spud to completion. Kern County.

Kettleman North Dome Field

Lytle, R. S., 5 Felix 35-21s-17w
Flowed 710 bbl., 47.3-gravity, 2 per cent cut, 24,000,000 cu. ft. gas. 48/64-in. bean. Pressures 1,500/1,500 lb. Elev. 1,010 ft. T.D. 10,872 ft. 8⅝-in. water string 10,540 ft. 356 ft. 4¾-in. drillable liner 10,872 ft. Perf. 10,536-10,872 ft., 10,554 ft. 2½-in. tubing. Completed in Avenal (Eocene). 193 days spud to completion. Kings County.

Vernales Gas Field

Standard 1 Blewett Comm. 25-3s-6e
Flowed 10,000,000 cu. ft. gas. 1-in. bean. Elev. 62 ft. T.D. 3,872 ft. 8⅝-in. water string 3,840 ft. 40 ft. 4¾-in. liner including 13 ft. of perf. 3,871 ft. Perf. 3,858-71 ft. 3,860 ft. 1½-in. tubing. Opens up new gas field in Vernales district. 36 days from spud to completion. San Joaquin County.

SAN JOAQUIN VALLEY OUTPOSTS

Coles Levee Field

Standard 20-8 Kern County Land 5-31s-25e
Drilling 8,860 ft., hard cherty shale.
Standard 20-9 Kern County Land 9-31s-25e
Derrick. Kern County.

Elk Hills Field

Standard 42-31-S 31-30s-24e
Drilling 5,994 ft. Cemented 18⅝-in. surface pipe at 1,224 ft. Kern County.

Kettleman North Dome Field

Standard 1-1-U fee 1-23s-16e
Drilling hard gray shale at 10,968 ft. Kings County.

Midway-Sunset Field

No. Amer. Oil Consd. 1-28 W.P. 28-32s-23e
Drilling 5,080 ft. in hard shale. Kern County.

Paloma Field

Western Gulf 12-12-B Kern County Land 12-32s-26e
Drilling 10,330 ft. in hard sandy shale. Kern County.

Rio Bravo Field

Union 41-33 Pacific States 33-28s-25e
Drilling 11,396 ft. in sandy shale. Kern County.

Strand Field

Associated 25-7-E Kern County Land 7-30s-26e
Drilling 11,391 ft. in hard sand and shale. Kern County.

Wheeler Ridge Field

Richfield 2 Kern County Land 28-11n-20w
Coring 11,270 ft. in siltstone. Kern County.

SAN JOAQUIN VALLEY WILDCATS

Panoche District

Jergins Trust 2 Cheney 29-14s-13e
T.D. 7,360 ft., P.B. 7,280 ft. Formation test flowed 700 bbl. water. Fresno County.

Cantua Creek District

Texas 27-13 Southern Pacific 13-17s-15e
Derrick. This will be third attempt to develop production in Cantua district. Location 990 ft. N, 990 ft. E of SW cor. 13-17s-15e. Ground elev. 340 ft. Fresno County.

Buena Vista Hills District

Honolulu 25-P fee 10-32s-24e
Drilling 11,610 ft. in hard tight brown shale. Kern County.

Buttonwillow District

Texas 47-15 Southern Pacific 15-29s-24e
Rigging up rotary drilling equipment. Kern County.

Potrero Hills District

Richfield 3 Potrero 10-4n-1w
Drilling 3,796 ft. Formation test 3,590-3,652 ft., open 38 min., showed small blow. Recovered 20 ft. gas-cut mud. Solano County.

Rio Bravo District

Wilshire 1 Campen 1-29s-25e
T.D. 11,390 ft. in oil sand. 7-in. casing cemented 11,366 ft. with 1,500 sacks cement. Located between Greeley and Rio Bravo fields. Kern County.

Shafter District

Continental Oil Co. 2-C Kern County Land 35-27s-24e
Drilling 659 ft. in sandy shale. This wildcat is located between the Wasco and Rio Bravo fields. Kern County.

LOS ANGELES BASIN

Standard Oil Co. is reaming 3-1 Los Angeles Investment in the Inglewood field to straighten the hole before proceeding with further work. This well which is a south offset to Bush 1 Sentous has not shown up any too well during the course of work. Total depth is 8,922 ft. and no appreciable amount of oil sand has been logged to date. A recent formation test at 8,805-8,900 ft. with the tester open for 45 minutes showed a light blow of gas and a recovery of 230 ft. of drilling mud with slight traces of oil and gas. No. 3-1 Los Angeles Investment is deeper than 1 Sentous which proved up the existence of commercial production in the Miocene last September as the latter well was brought in flowing 360 bbl. from 8,760 ft. Standard might still be able to complete 3-1 Los Angeles Investment but at its present depth it will be a small well at best. Up in the northwest end of the Inglewood field, R. R. Bush has reached a depth of 7,970 ft. in 1 Smith which was originally started several months ago and then suspended for a period of about 60 days. This well appears to be running higher structurally than Bush 1 Sentous. It has been showing an increasing amount of gas and is believed to be either in the top of the Miocene or in the transition zone between Pliocene and Miocene. The status of this well may be determined within the next fortnight.

Dominguez

Union Oil Co. has passed the 12,000-ft. level in 79 Callender, a deep test in the west central part of the Dominguez field in Los Angeles Basin but has apparently not yet found anything worth testing. This well is in the middle Miocene and is about 4,500 ft.

below the eighth Callender zone which is the deepest producing horizon found in the field to date. It is the deepest well drilled in the Dominguez field up to the present. R. E. Havenstrite has suspended work on 5 Larronde at 7,818 ft. due to the inability to make the well produce either naturally or on the beam and has definitely fixed the outer limits of production at this point. Shell Oil Co., Inc., established a new record for the Dominguez field by drilling and completing 111 Reyes in 8 days from the time the bit first began making hole. This new well was carried down to 4,220 ft. and finished with a 9⅝-in. surface string cemented at 950 ft. and a 5½-in. oil string landed at 4,214 ft. and cemented through perforations with 200 sacks of cement at 3,835 ft. After the cement job had set the string was gun perforated at 3,822-24 ft. Perforations had been made in the string at 3,841-3,974 ft., 3,982-4,031 ft., 4,040-4,121 ft., 4,124-71 ft., 4,183-4,214 ft. before the string was run in the hole. Actual production is not yet available although the well looks good for about 250 bbl. per day.

Long Beach

Union Oil Co. which established a new deep drilling record for the Dominguez field this week also established a new deep drilling record for the Long Beach field. The company's 19 Long Beach Community is drilling ahead at 10,600 ft. with frequent cores being taken. This well which is slightly lower structurally than other deep-zone wells in this field has enough formation available to make a good well but the company has apparently decided to make some additional hole before making a production test. Three wells have been finished in the Dormax zone around 10,500 ft. but none of them has shown large production. Union Oil Co. is not drilling 19 Long Beach Community in an effort to precipitate a deepening campaign. Lease requirements forced the company to undertake offset drilling in order to prevent any drainage by wells of other companies on adjacent leases.

LOS ANGELES BASIN COMPLETIONS

East Coyote Field

Union 2 Toussau fee 22-3s-10w
Pumped 120 bbl., 21.3-gravity, 2 per cent cut. Elev. 265 ft. T.D. 7,775 ft. P.B. 7,305 ft. 7-in. water string 4,120 ft. 3,258 ft. 5½-in. liner 7,305 ft. Perf. 6,726-7,305 ft. 6,580 ft. 2½-in. tubing. Completed in Stern zone. 102 days from spud to completion. Orange County.

Huntington Beach Field

Signal O. & G. Co 11 Bolsa 34-5s-11w
Flowed 880 bbl., 28.1-gravity, 0.4 per cent cut, 560,000 cu. ft. gas. 39/64-in. bean. Pressures 155/450 lb. Elev. 14 ft. T.D. 3,686 ft. P.B. 3,501 ft. 8⅝-in. water string 2,770 ft. 750 ft. 6⅝-in. liner 3,501 ft. Perf. 2,771-3,501 ft. 3,450 ft. 2½-in. tubing. Completed on gas lift in Bolsa. 18 days drilling time. Orange County.

Signal O. & G. Co. 16 Bolsa 34-5s-11w
Flowed 235 bbl., 26.5-gravity, 3 per cent cut. Elev. 14 ft. T.D 3,836 ft. 8⅝-in. water string 3,576 ft. C.P. 1,031 lb. 280 ft. 6⅝-in. liner 3,835 ft. Perf. 3,572-3,835 ft. 3,786 ft. 2½-in. tubing. Finished in Bolsa zone. 15 days drilling time. Orange County.

Southwest Expl. Co. 34 State 3-6s-11w
Pumped 410 bbl., 28.4-gravity, 0.5 per cent cut. Elev. 49 ft. T.D. 5,250 ft. 8⅝-in. water string 4,353 ft. 928 ft. 6⅝-in. liner 5,250 ft. Perf. 4,372-5,250 ft. 4,184 ft. 2½-in. tubing. Completed in Huntington tidelands beneath Pacific Ocean. 39 days drilling time. Orange County.

Long Beach Field

Bush Oil Co. 5 fee 20-4s-12w
Pumped 40 bbl., 18.8-gravity, 50 per cent cut. Elev. 134 ft. T.D. 4,315 ft. 6⅝-in. combination string 4,250 ft. Perf. 3,975-95 ft., 4,020-70 ft., 4,180-4,215 ft. 75 ft. 4½-in. perf. liner 4,314 ft. 3,790 ft. 2½-in. tubing. Completed in Alamitos zone. 40 days drilling time. Los Angeles County.

Losch, J. R. 1 Deatherage 30-4s-12w
Pumped 55 bbl., 23.8-gravity, 20 per cent cut. Elev. 75 ft. T.D. 3,486 ft. 4¾-in. water string 3,350 ft. 156 ft. 3½-in. liner 3,486 ft. Perf. 3,350-3,486 ft. 3,295 ft. 2½-in. tubing. 110 days drilling time. Los Angeles County.

Montebello Extension Field

Kern Oil Co. 40 Monterey 2-2s-12w
Flowed 120 bbl., 29.9-gravity, 30 per cent cut, 50,000 cu. ft. gas. Elev. 325 ft. T.D. 6,735 ft. 7-in. water string 6,667 ft. 68 ft. 5-in. liner 6,735 ft. Perf. 6,677-6,735 ft. 6,550 ft. 2½-in. tubing. Completed in eighth zone on gas lift. 105 days drilling time. Los Angeles County.

Rosecrans Field

Rainbow Drlg. Co. 21 Crawford 19-3s-13w
Flowed 75 bbl., 36.1-gravity, 0.1 per cent cut, 260,000 cu. ft. gas. 20/64-in. bean. Pressures 250/500 lb. Elev. 240 ft. T.D. 8,543 ft. 5½-in. water string 8,315 ft. 264 ft. 4½-in. liner 8,543 ft. Perf. 8,295-8,543 ft. 8,533 ft. 2½-in. tubing. Completed in lower O'Dea zone. 205 days drilling time. Los Angeles County.

Royalty Service Corp. 4-A-W 19-3s-13w
Flowed 215 bbl., 32.1-gravity, 0.5 per cent cut, 750,000 cu. ft. gas. 30/64-in. bean. Pressures 250/500 lb. Elev. 67 ft. T.D. 8,000 ft. 7-in. water string 7,610 ft. 401 ft. 5½-in. liner 8,000 ft. Perf. 7,614-8,000 ft. 7,680 ft. 2½-in. tubing. Completed in O'Dea zone. 37 days drilling time. Los Angeles County.

South Basin Oil Co. 102 Athens 19-3s-13w
Flowed 452 bbl., 32.1-gravity, 2 per cent cut, 500,000 cu. ft. gas. 35/64-in. bean. Pressures 300/500 lb. Elev. 60 ft. T.D. 7,986 ft. 7-in. water string 7,615 ft. 392 ft. 4¾-in. liner 7,986 ft. Perf. 7,623-7,980 ft. 7,966 ft. 2½-in. tubing with packer 7,566 ft. Completed in O'Dea (Miocene). 48 days drilling time. Los Angeles County.

Santa Fe Springs Field

Union 103 Bell 6-3s-13w
Flowed 1,775,000 cu. ft. gas. 16/64-in. bean. Pressures 790/835 lb. Elev. 160 ft. T.D. 2,525 ft. 6⅝-in. flow string 2,524 ft. Perf. 2,430-41 ft. Completed in gas zone above Foix. Production shut in. 7 days drilling time. Los Angeles County.

Seal Beach Field

Continental 45 Bixby 2-5s-12w
Pumped 280 bbl., 25.2-gravity, 60 per cent cut. Elev. 12 ft. T.D. 4,421 ft. 6⅝-in. water string 4,410 ft. 29 ft. 4½-in. gravel-packed liner 4,420 ft. Perf. 4,410-20 ft. 2,575 ft. 3-in. tubing. Completed in Bixby zone. 34 days drilling time. Orange County.

Wilmington Field

Exeter Oil Co. 1 Community 32-4s-13w
Flowed 150 bbl., 17.2-gravity, 4 per cent cut, 30/64-in. bean. Pressures 150/150 lb. Elev. 15 ft. T.D. 3,714 ft. 8⅝-in. water string 3,016 ft. 752 ft. 5½-in. liner 3,714 ft. Perf. 3,021-3,290 ft., 3,370-3,714 ft. 3,596 ft. 2½-in. tubing with packer at 2,920 ft. Completed in Ranger zone. 26 days drilling time. Los Angeles County.

Gremac Oil Corp. 10 Harbor 32-4s-13w
Flowed 240 bbl., 17.6-gravity, 5 per cent cut, 11/64-in. bean. Pressures 125/150 lb. Elev. 14 ft. T.D. 3,645 ft. 8⅝-in. water string 2,795 ft. 875 ft. 5¾-in. liner 3,635 ft. Perf. 2,800-2,980 ft., 3,340-3,520 ft., 3,540-3,635 ft. 3,160 ft. 3-in. tubing including 850 ft. of 2½-in. Completed in Ranger zone. 17 days drilling time. Los Angeles County.

Madison, Leslie 3 Kern 32-4s-13w
Pumped 180 bbl., 15.6-gravity, 5 per cent cut. Elev. 37 ft. T.D. 3,714 ft. 8⅝-in. water string 3,003 ft. 729 ft. 5¾-in. gravel-packed liner 3,709 ft. Perf. 3,003-12 ft., 3,370-3,709 ft. 2,995 ft. 2½-in. tubing. Completed in Ranger zone. 13 days drilling time. Los Angeles County.

Security Drlg. Co. 1 Harbor 32-4s-13w
Pumped 145 bbl., 16.3-gravity, 5 per cent cut. Elev. 29 ft. T.D. 3,637 ft. 9-in. water string 2,974 ft. C.P. 1,010 lb. 689 ft. 5½-in. liner 3,636 ft. Gravel-packed perf. 2,970-3,050 ft., 3,100-85 ft., 3,280-3,541 ft., 3,580-3,636 ft. 3,614 ft. 2½-in. tubing. T.D. 3,637 ft. Completed in Ranger zone. Los Angeles County.

Silver Pet. Co. 1 Harbor 30-4s-13w
Pumped 140 bbl., 19.1-gravity, 5 per cent cut. Elev. 51 ft. T.D. 3,761 ft. 7-in. combination string 3,761 ft. Gravel-packed perf. 3,566-3,761 ft. 3,650 ft. 2½-in. tubing. Completed in Ranger zone. 27 days drilling time. Los Angeles County.

LOS ANGELES BASIN OUTPOSTS OR DEEP TESTS

Dominguez Field

Union 79 Callender 32-3s-13w
Drilling at 12,160 ft. Los Angeles County.

(Continued on Page 85)

A Natural Gas Line that's DOWN to STAY DOWN!

Laying 22-inch natural gas line under city street pavements.

NO-OX-ID Coatings and Wrappers protect gas line under city pavements

This 22-inch line, laid under city pavement where electrolysis is excessive, cannot be pulled up for repairs except at great expense. That is why it is completely protected with NO-OX-ID Coatings and NO-OX-IDized Wrappers.

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NO-OX-ID Coatings and NO-OX-IDized Wrappers are available in many different specifications to suit each individual condition. They may be applied either hot or cold, by hand, traveling machine, or stationary machine. Ask for detailed information on any specific job.

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NO-OX-ID IRON + OX = RUST
The Original Rust Preventive

RUST PREVENTIVE PIPE COATINGS

DEARBORN CHEMICAL COMPANY
NO-OX-ID-IZED WRAPPER
NEW YORK CHICAGO

Steveville Test Increases Flow After Acidization

By VICTOR LAURISTON

CHATHAM, Ont., Jan. 18.—In the Steveville field, east of Calgary, Standard Oil of British Columbia 2 Princess, LSD 3, 13-20-12w4, finished in the Devonian lime at 4,250 ft. and plugged back to 3,325 ft. to test the upper Madison, maintained a natural flow around 168 bbl. a day through ½-in. choke for a week. It was gun perforated and given initial acid treatments, and flowed 381 bbl. of water free crude in the first 24 hours, with a measured gas flow of 9,900,000 cu. ft. Acidizing and testing is being continued.

North Turner Valley: Home Oil 1, LSD 8, 33-20-3w5, is perforating casing in 3 potential zones in the lime, to acidize and test production. Home Oil 6, LSD 8, 28-20-3w5, finished drilling at 8,446 ft., 466 ft. in the limestone, and is testing production.

West-Central field: Royalite Oil 53, LSD 4, 19-19-2w5, got the Madison lime at 7,232 ft. and is deepening after cementing 7-in. casing at 7,248 ft. This is the first test in Section 19 to prove the lime. Royalite 54, LSD 1, 7-19-2w5, finished at 7,367 ft., 431 ft. in the lime, and is testing production.

Southwest field: Commoil 4, LSD 9, 29-18-2w5, finished at 7,308 ft., is acidizing and testing.

New Tests Starting

North Turner Valley: Major Oils 2, LSD 12, 4-21-3w5, is spudding. Location is a half mile north of the nearest producer. Major 3, LSD 1, 8-21-3w5, still farther north, is rigging heavy duty rotary.

Several tests will be drilled in 17-21-3w5 by Atlas Investments, Ltd. in association with British Dominion Oil & Development Corp. Atlas-British Dominion 2 has been spotted in LSD 4, more than a mile northwest of Major Oil 3, and 2 miles north and west of Alberta Oil Incomes 2, the nearest crude producer. The area has been geologized by Dr. J. O. G. Sanderson, who estimated the Madison at 6,700 ft., compared with 8,800 ft. in Alberta Oil Incomes 2. Atlas Drilling Co. will handle the contract, using diesel rotary outfit, under supervision of Glen Boller. Test will likely spud in February.

Home Oil 9, LSD 9, 15-20-3w5, is working on derrick.

West-Central field: Southwest Petroleum 5, LSD 2, 8-19-2w5, is rigged.

Border Fields

Blood Indian Reserve: Northwest-West Petroleums 1, LSD 3, 20-5-23w4 got the Madison lime at 6,120 ft., and is deepening after cementing casing at 6,124 ft. Shows of oil and gas were encountered at the Madison contact.

Taber field: Majestic Mines has cleaned out and is operating Plains Petroleum 2. Additonal tankage has been provided, and upwards of 1,200 bbl. have been stored. The well is making 45 bbl. a day, with some water. Majestic Mines is planning erection next spring of a 150-bbl. refinery to handle the output and market its products locally.

East Central Alberta

Vermilion field: Franco-Hamers 1, LSD 16, 19-50-6w4, got the oil sand at 1,840 ft., with indications of a fair production of heavy crude. Franco-Hamers 2 is starting a quarter mile south on the same farm, about 6 miles due east of Vermilion.

Moose Dome Test

On the Moose dome, northwest of Calgary, McColl-Frontenac Oil Co. 1, LSD 9, 6-23-6w5, made drill-stem test of a small gas show at 2,635 ft. but failed to develop oil. Well is being deepened for commercial production.

Alberta Drilling Record

Drilling footage in Alberta in 1940 totaled 370,104 ft. of hole, compared with 374,287 ft. in 1939, the all-time record. Up to the end of 1940 drilling in Alberta totaled 3,375,710 ft., of which 2,055,294 ft. was drilled in Turner Valley. The 1940 drilling included: Turner Valley, 59 wells, 296,832 ft.; foothills, six wells, 6,799 ft.; other fields, 37 wells, 66,473 ft.

Eastern Kentucky

(Continued from Page 64)

and plan a Corniferous test in 1 Anthony Isom, on Pasture Branch. No. 1 Rolla Dixon was dry at 1,201 ft., and No. 2 on the same land on Pasture Branch, was dry in Big lime.

WESTERN KENTUCKY COMPLETIONS

Daviess County

Handyville district: Staves Drilling Co. 7 L. I. Igleheart, 150 bbl., 160-qt. shot, Jett sand 1,248-84 ft., T.D. 1,287 ft.

Teller 3 E. F. Lebold, North tract, 130 bbl., 130-qt. shot, Jett sand 1,257-85 ft., T.D. 1,293 ft.

Utica district: Creek Drilling Co. 4 T. M. O'Flynn, dry, T.D. 1,376 ft.

The Petroleum Co. et al 4 R. C. Jewell, rigging up.

Pellville district: Leeper 11 Chester Veach, dry, T.D. 550 ft.

Hancock County

Saunders School district: Fordsville Oil Co. 3 R. Ashworth, 10 bbl., 30-qt. shot, Jett sand 413-26 ft., T.D. 458 ft.

Pellville district: Leeper 7 Ira Jett, drilling at 500 ft.

McLean County

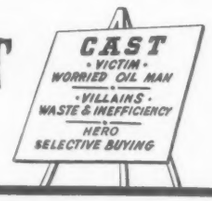
South Livermore district: Ellis 4 Stevens heirs, 510 bbl., flow, natural, McClosky 1,627-30 ft.

Webster County

Sebree district: Big Four Oil & Gas 1 Chamberlin, abandoned location.

FROM SPOT TO·SPOTLIGHT

(It Happened in the Oil Fields)



SCENE 1 *(On The Spot)*

Here's an oil man "on the spot". With the front office barking for lower line pipe costs, life is no bed of roses.

SCENE 2 *(The Rescue)*

There is no cause for worry. "Selective Buying," ARMCO'S plan for lower line pipe costs, comes to the rescue by demonstrating cash-in-pocket savings.

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"Selective Buying" routs waste and inefficiency. It's easy to select the size and gage of ARMCO Pipe to fit the job. Diameters range from 6 to 36 inches, wall thicknesses 7/64 to ½-inch. No excess weight. Lengths up to 50 feet mean fewer sections to handle, fewer joints to weld. Costs take a tumble.

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By
ROBERT INGRAM

Okfuskee County Gas Well Year's Second Discovery

OKFUSKEE County paid off again this week on the heavy wildcat play that started last fall. This time it was with a good gas discovery at the Deep Rock Oil and Fred Coogan 1 Earl Davis, SW SE NE 20-11-9, southwest of Okemah. Originally drilled to the Wilcox by Coogan, the well was apparently a failure at a total depth of 4,147 ft.

Deep Rock took it over at that point, plugged back to the Hunton lime at 3,912-16 ft. and got an estimated 6,000,000 cu. ft. of gas. The well was then acidized through perforations and it was completed for 52,285,000 cu. ft. per day. Pressure is about 1,500 lb. per sq. in. The well is on a lease spread of about 900 acres.

At the same time testing continued at another Okfuskee County discovery, the J. H. Harvey and Selden Henry 1 Dudgeon, NE SW SE 36-12-9, which showed for the first pool of 1941 when it flowed January 2 at the rate of 120 to 200 bbl. of oil a day from the Gilcrease sand at 3,084-3,110 ft. On the last gage the well flowed 95 bbl. in about 1 hour after opening. Hearing has been set for January 28 on application of the Arrow Drilling Co., contractor and interest holder in the lease block, for 10-acre well spacing.

Gusher Struck in Konawa Area

One of the largest producers of the year for the state was Culver & Shepherd et al 3 Waite, NW SW NE 9-5-5, in the south Konawa area on the Seminole-Pottawatomie county line. The well flowed 187 bbl. an hour for 3 hours through tubing.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: Cement	2	496	6,696
West Hewitt	4	291	8,181
Edna	1	35	3,218
Oklahoma City	1	298	6,529
Other fields	9	1,272	25,495
Wildcats	2	585	7,227
Gas wells: Wildcats	2	*8	6,386
Fields	1	*1	2,631
Dry holes: Wildcats	3	.....	11,864
Fields	2	.....	5,863
Total	27	.....	84,140
Recompletions: Coyle	1	700	.....
Other fields	3	79	.....
Total	4	779	.....

*Million cu. ft.

Production is from the Hunton lime, topped at 2,368 ft., and as soon as a spudder crew broke the plug on 7-in. casing set at 2,368 ft., the well started flowing. Approximately 3,000 bbl. was turned into tanks and pits while crews were getting tools out of the hole and making connections.

Pipe Line Built to Cumberland

Two new wells were added to the Dill pool and new work was reported on several leases. At Cumberland, Pure was completing 1 Crissman, NE NE NE 29-5-7, on the northwest tip after repeated testing. At plug-back depth of 5,082 ft., the well flowed 232 bbl. in 24 hours through casing, then flowed 183 bbl. by heads while running tubing.

Southwestern Oklahoma was getting into the play with Skelly 1 Frensley, C NE NE 35-1s-5w, and Gulf 1 Krieger, E½ NE SW 3-2n-5w, drawing attention to Stephens County; a new test—John Graham et al 1 Scheidenheim, NE NE SE 35-5n-9w, reported ready to start a 5,000-ft. test for Caddo County, and steady development going ahead at West Frederick and the Hewitt field extension of Carter County.

OKLAHOMA COMPLETIONS

Caddo County

Cement field: Phillips 3 Farwell, SW NE NW 35-6n-10w, swabbed and flowed potential 443 bbl., casing 3,341 ft., sand 3,355 ft., T.D. 3,421 ft.
Magnolia 9 Medrano, SW NW SW 36-6n-10w, pumped 53 bbl., casing 3,232 ft., sand 3,232-57 ft., T.D.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	Jan. 18	Jan. 11
Allen	4,825	4,800
Billings	6,200	6,225
Burbank	7,200	7,225
South Burbank	7,325	7,350
Balance Osage	16,600	16,750
Blackwell district	3,325	3,350
Bristow-Slick	6,275	6,300
Chandler	1,025	1,025
Crescent	2,000	1,975
East Cromwell	1,900	1,750
Cromwell	2,825	2,825
Cushing-Shamrock	8,800	8,825
Duncan	3,550	3,550
Edmond	3,575	3,575
Fish	2,850	2,875
Fitts	13,600	14,100
Jesse	1,850	2,050
Graham-Fox	2,225	2,200
Gray	850	850
Healdton	8,300	8,300
Hewitt	7,650	7,475
Keokuk	2,750	2,675
Konawa	975	1,000
Lucien	6,400	6,450
Moore	1,050	1,050
Northeastern counties	16,750	17,000
Oklahoma City	85,975	84,750
Olympic	1,725	1,750
Ramsey	3,450	3,500
Sasakwa	1,375	1,375
Sholem-Alechem	2,550	2,550
Seminole district:		
Bowlegs	6,425	6,450
Carr City	2,125	2,175
Dora	1,550	1,575
Earlsboro	3,875	3,875
East Earlsboro	1,725	1,725
South Earlsboro	550	525
Little River	6,525	6,550
East Little River	625	625
Mission	1,250	1,250
Seminole	6,250	6,225
East Seminole	1,025	1,025
Searight	1,800	1,825
Total Seminole	33,425	33,825
St. Louis-Pearson	21,375	21,450
Tatums-Tussy	4,750	5,050
Tonkawa-Garber-Thomas	3,600	3,575
Wewoka	1,575	1,550
Yale-Jennings	3,050	3,050
Total Oklahoma	388,550	388,275

Carter County

West Hewitt pool: Kyle 10 Daugherty, SE SW 17-4s-2w, pumped 159 bbl., casing 1,981 ft., sand 1,981-2,010 ft., shot 1,992-2,012 ft., T.D. 2,022 ft.
Gibson 2 Herrell, SE NW 20-4s-2w, pumped 33 bbl., casing 1,791 ft., shot 1,797-1,803 ft., T.D. 1,810 ft.
Porterfield 3 Walker, NW NE 20-4s-2w, pumped 85 bbl., casing 2,002 ft., T.D. 2,052 ft.
Lamb 3 fee, NE NW 29-4s-2w, pumped 14 bbl., sand 2,250 ft., T.D. 2,297 ft.

Creek County

Wildcat: Wilcox 1 Deere, NE SW NE 34-14-7, 6,000,000 cu. ft. gas, Prue 2,520-55 ft., T.D., casing 2,519 ft.
Edna pool: Vierson 3 Judeman, NE SE NW 24-14-10, pumped 35 bbl. oil, 3 bbl. water, Wilcox 3,202-18 ft., shot 3,200-16 ft., casing 2,188 ft., T.D. 3,218 ft.
Cushing district: S. S. Home 32 Atkins, E½ SW NE 5-18-7, pumped 10 bbl. oil, 46 bbl. water, Bartlesville 2,577-2,644 ft., T.D., shot.
Sinclair-Prairie 20 Long, N½ NE SW 9-18-7, old well drilled deeper from 2,680 ft. to 2,710 ft., shot 2,686-2,710 ft., pumped 2 bbl.

Garvin County

Tussy pool: Cox 1 Parton, SW SE SE 29-1n-3w, pumped 80 bbl., casing 1,868 ft., sand 1,940-56 ft. and 1,962-72 ft., T.D. 2,266 ft.

Kiowa County

Hobart pool: Gled 1 Howard, SW NE 20-7n-17w, dry, sandy Arbuckle 2,543-56 ft., T.D., casing 2,540 ft., P.B. 1,200 ft., shot 1,175-81 ft.

Lincoln County

Prague pool: Mid-States 5 Provaznik A, SW NW SW 33-12-6, pumped 85 bbl., Skinner 3,282 ft., casing 3,282 ft., shot 3,298-3,310 ft., T.D.

Marshall-Bryan Counties

Cumberland pool: Pure 1 Park College 200, SW SE 27-5s-7e, old well acidized, T.D. 5,231 ft., casing 5,070 ft., P.B. 5,118 ft., acid, pumped 7 bbl.

Logan County

Wildcat: I.T.I.O. 1 Cronkhite, NE SE NW 35-12n-3w, dry, Wilcox 7,035 ft., T.D. 7,134 ft.

Okfuskee County

Wildcat: Portable 1 Nelson, NE SE SW 1-11-9, dry, Booch 2,843 ft. showed possible gas and oil in electric log, T.D. 4,108 ft.
Davon 2 Marshall, SE SW 34-12-9, 2,000,000 cu. ft. gas, casing 3,768 ft. in Hunton, T.D. 3,831 ft.

Oklahoma County

Oklahoma City: Champlin 1 Littlepage, SW NW NW 35-12n-3w, pumped 298 bbl., Wilcox 6,288 ft., casing 6,286 ft., shot 6,500-29 ft., T.D.

Payne County

Coyle pool: Texas 1 Minnich, W½ SE NE 11-17-1, old well P.B. from 4,949 ft. to 4,975 ft., perf. 4,665-85 ft., flowed 700 bbl. in 12 hr.
Norfolk pool: Deep Rock 5 Laughlin, NW SW NE 2-18-5, old well P.B. from 2,785 ft. to 2,702 ft., acid, flowed 70 bbl.

Pawnee County

Wildcat: Alma 1 Hill, N½ NW SW 1-21-5, flowed 500 bbl. oil, 800 bbl. water, casing 3,240 ft., chert 3,369 ft., Misener 3,363-39 ft., T.D.

Pottawatomie County

West Asher pool: Grisso 1 La Reau, NE SW 33-6-3, old well drilled deeper from 3,615 ft. to 4,158 ft., dry.
St. Louis district: Sinclair-Prairie 4 Regan, SW SE NE 17-7-4, swabbed 669 bbl., sandy dolomite, casing 4,220 ft., T.D. 4,225 ft.
I.T.I.O. 7 Weems, NE NW SW 21-7-5, flowed 31 bbl., casing 2,770 ft., shot 2,775-85 ft., T.D. 2,786 ft.

Seminole County

West Konawa: Davis 1 Jones, NW SE SW 34-6-5, pumped 15 bbl., casing 2,177 ft., shot 2,194-2,204 ft., T.D. 2,218 ft.
Dora pool: Justin 1 Shider, NE SW NE 5-6-6, dry, Cromwell 3,273 ft., T.D. 3,307 ft.
West Little River: Sinclair-Prairie 4 Tewee, SW NE 14-7-6, swabbed 302 bbl., shot 3,159-66 ft., casing 3,125 ft., Cromwell 3,124 ft.
Dustin gas field: Moffett 1 Ritchilie, C NW NE 31-10-12, 1,000,000 cu. ft. gas, Gilcrease 2,624-31 ft., casing 2,080 ft., T.D. 2,631 ft.
Conservation pool: Mitchell 1 Harris, NE SW SE 19-5-6, pumped 50 bbl., casing 2,302 ft., Hunton 2,445 ft., T.D. 2,643 ft.

Stephens County

Wildcat: Gulf 1 Fisher, C SE SW 13-2s-4w, pumped 85 bbl., Hunton 3,612 ft., T.D. 3,987 ft., casing 3,948 ft., acidized and shot 3,957-83 ft.
Comanche pool: Pace 26 Allen, SE NE NE 3-2s-8w, pumped 30 bbl., sand 2,220-37 ft., T.D., Jeep, casing 2,220 ft.

Tillman County

Wildcat: Kirkey 1 Garner, NE SW SE 24-1n-17w, dry, T.D. 622 ft.

OKLAHOMA DRILLING REPORT

Caddo County

Ray Stephens 1 Lankford.....SE SE NW 6-6-9w
S.D. 5,200 ft.

Carter County

Wirt Franklin 1 Rittenhouse.....SE NE SE 5-4s-2w
Location, 3,000-ft. test.

Creek County

Roy Starr 1-A Lumn.....SE NW SE 8-14-8e
Location.

Grady County

Tom Palmer 1-A Ramsey.....SE SE NE 36-5-8w
Drilling 3,770 ft.
W. H. Atkinson 1 Gilks.....NE NE SE 22-5-7w
T.D. 4,005 ft., may drill deeper, show gas.

Hughes County

Magnolia 1 McKoy.....SW SW SE 16-5-11
T.D. 6,400 ft., blew gas and mud, S.I. pressure on casing 950 lb., prepare to core.
Mid-Continent 1 J. Davis.....SE SE NW 15-6-8e
Rig.

Greer County

Mutual Oil 1-A Caves.....NW cor. 36-4-21w
S.D. 800 ft., will run 6⅝-in. casing.

Jackson County

G. R. Burke 1 Estes.....SW SW NE 34-3n-19w
Drilling 990 ft., granite.

Jefferson County

Danciger Oil 1 Hefner.....SE cor. 3-4s-4w
Set whipstock 3,581 ft., drilling 4,211 ft.
Johnson Drilling 1 Bound.....SW SW 13-6s-6w
T.D. 1,855 ft., slight show, will recement casing.

Kay County

Earl Williams 1-A Trueblood.....NE SE SE 25-25-1w
T.D. 2,424 ft., fishing with 200 ft. oil in hole and hole full of water.
Marland Oil Co. 1 Kreger.....SE SE NE 4-25-2w
Tonkawa sand 2,685-2,717 ft., drilling 2,780 ft.
Continental 1 Cronan.....NW NE SW 23-28-3
S.D. 2,670 ft., to repair pump.
Union National 1 Long.....NW NW NW 29-28-1e
Old T.D. 1,670 ft., ran liner by fish, having trouble drilling by shoe, est. 100 bbl. oil from Wilcox.

Kiowa County

Artie Baker 1 Coakley.....NW NE SE 30-7-17w
Show oil 1,226-28 ft., 7-in. 1,226 ft., drilling 1,249 ft.

Lincoln County

Mid-Continent 1 School land.....NW NE NW 36-12-3e
(Continued on Page 83)

By

R. MARNE SANFORD

Deep Exploration Centered in Pecos and Ward Counties

MIDLAND, Tex., Jan. 20.—A deep Ordovician wildcat located 9 miles west of the Abell field in Pecos County centered considerable attention during the past week as free oil was bailed from a thin section of saturation in the Ellenburger lime. Also new locations and acreage sales in the Abell field itself, together with new activity for the Delaware basin in western Ward and in Reeves counties, totaled a busy week for the Permian basin district.

Culbertson & Irwin 1 Mary Heiner, Section 589, G.C.&S.F. Survey, 9 miles west of the Abell field in northern Pecos County, found slight shows of oil from 5,390-92 ft. in the Ellenburger lime early in the week and, when bailed dry at a total depth of 5,401 ft., bailed 11½ gal. of 36-gravity oil. The oil show was passed up, however, and at the close of the week the test was drilling below 5,444 ft. with no more shows reported.

SUMMARY OF COMPLETIONS

Southern West Texas

	No.	Bbl.	Footage
Oil wells: McElroy field	2	3,540	5,845
Ector County	2	1,432	7,700
Keystone field	2	445	6,351
Other fields	4	3,495	8,812
Dry holes: Wildcat	1	.....	4,400
Total	11	.....	33,108

Northern West Texas

Oil wells: Seminole field	7	3,844	37,080
Sharon field	2	438	4,134
Wasson field	3	2,987	15,549
Other fields	2	1,981	9,764
Dry holes: Wildcat	1	.....	4,265
Total	15	.....	70,792

Panhandle

Oil wells: Pampa field	3	259	9,836
Borger field	2	518	6,078
Other fields	1	225	3,001
Total	6	.....	18,915

Southeast New Mexico

Oil wells: Eddy County	2	80	5,603
Dry holes: Eddy County	2	....	2,402
Total	4	.....	8,005

In the Abell field George T. Abell spudded 1 E. J. Rixse, 330 ft. from the south and east lines of Lot 8, Section 25, Block 9, H.&G.N. Survey, about ¾ mile east of the old Tex-Mex Oil and Magnolia 1-A McKee failure just north of the discovery oil well for the field. The new test will be drilled to 2,500 ft. in search of Permian lime production; however, it will be recontracted to the deep levels in the event no commercial production is encountered. This location, together with Phillips Petroleum Co.'s recently staked deep test in the area, totals five active operations for the deep field.

Ward County

The new Silurian area recently opened by Gulf Oil Corp. in Ward County, together with the little-developed Hayes gas area, both received plays during the week. In the Hayes area Kenneth Slack, of Pecos, who drilled the discovery gas well last year, turned to Jim Dunigan of Breckenridge 200 acres in Sections 164 and 166 for a consideration of $100 per acre. In the western part of Ward County and as an exploratory test, J. E. Fitzpatrick, who was associated with Slack in the discovery well in the Hayes area, has staked location for a deep Delaware lime test. It is 1 T. B. Pruitt, 467 ft. from the southwest and southeast lines of Section 23, Block 1, W.&N.W. Survey. It has been spudded to 105 ft.

In the Silurian field just south of the Shipley area in Ward County Humble Oil & Refining Co. has bought into the development. The company acquired two tracts about 5 miles north and slightly east of the discovery well for a consideration of $7.50 per acre cash and an equal amount out of oil. It also purchased the NW¼ of Section 28, Block 28-B, P.S.L. Survey, about 3 miles northeast of the discovery, for a consideration of $10 cash per acre and $5 per acre out of oil.

A new wildcat for Reeves County is J. T. Pemberton 1 fee, 467 ft. from the north and east lines of Section 2, Block 55, Township 7, T.&P. Survey. Contracted to 7,000 ft., it is located about 6 miles southwest of the town of Toyah and approximately midway between that town and Hoban. The test is on acreage formerly held by Humble Oil & Refining Co., while Gulf Oil has large acreage holdings in the immediate area.

In Crockett County Indian Territory Illuminating Oil Co. has staked a 2,000-ft. test as 1 Roy Henderson, located 2,710 ft. from the south and east lines of Section 33, Block ST. It is scheduled to start at once.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Crane County

McElroy field: Gulf 235 McElroy, 1,234 bbl., open casing, 830 qt. shot, 2,745-2,991 ft.

Crockett County

Todd Deep field: Continental 7-B Todd, 3,081 bbl., open casing, 5,575-5,693 ft.

Noelke field: Mauldin & Salmon 1 Noelke, 300 bbl., natural, open tubing, 1,194-1,217 ft.

Ector County

Wildcat: Forest Development 1-B Edwards, Sec. 30, Blk. 43, Twp. 3s, T.&P. Sur., top anhydrite 1,710 ft., Yates sand 2,900 ft., Grayburg 3,835 ft., San Andres 4,255 ft., top porosity 4,365 ft., dry at 4,400 ft.

Foster field: Atlantic 4 Brock, 935 bbl., open tubing, 800-qt. shot, 3,890-4,100 ft.

Jordan field: Snowden & McSweeney 5 University, 497 bbl., natural, open tubing, 3,578-3,600 ft.

Pecos County

Fromme field: W. H. Burleson 2 Fromme, 42 bbl., 44/64-in. choke, 1,413-34 ft.

Tobarg field: Stanolind 6-B Smith, 72 bbl., oil, 5% water, pumping, 438-68 ft.

Upton County

McElroy field: Gulf 45 Crier-McElroy, 2,306 bbl., open casing, 690-qt. shot, 2,643-2,854 ft.

Winkler County

Keystone field: Bates & Reading 6 McCabe, 191 bbl., open tubing, 300-qt. shot, 2,835-3,044 ft.

Tide Water 1 Campbell, 254 bbl., open casing, 382-qt. shot, 3,110-3,307 ft.

SOUTHERN WEST TEXAS WILDCAT REPORT

Crane County

Gulf 1-F University, SE SE Sec. 22, Blk. 31, University Sur., drilling 9,008 ft.

Gulf 17 Waddell, Sec. 13, Blk. 3, H.&T.C. Sur., 4 mi. S of Sand Hills field, 12½-in. 138 ft.

Culberson County

Cecil Cothrun 1 Casey-Rounsoville, Sec. 7, Blk. 104, P.S.L. Sur., S.D. 1,271 ft., bailed some free oil.

Crockett County

Moore & Olson 2 Noelke, 495 ft. from N and 2,548 ft. from W lines, Sec. 77, Blk. G.G., T. W. Carter Sur., T.D. 1,217 ft., flowed 25 bbl. per hour, S.I.

Map of the recently opened deep Simpson (Ordovician) field in northern Pecos County showing the Taubert-McKee-Seimoneit 1 Crockett discovery well and the five active tests now in the field. Due north of the discovery well is the old Magnolia and Tex-Mex Oil 1 McKee, deep failure. Leases which are due to expire within the coming few months will keep this area active during the early part of this year

I. T. I. O. 1 Roy Henderson, NW SE Sec. 33, Blk. S.T., 2,000 ft., first report.

Ector County

Stanolind 1-B W. F. Cowden, SE W½ Sec. 12, Blk. 44, Twp. 1n, T.&P. Sur., deep Holt lime test, drilling 4,913 ft.

Cities Service 1 F. V. Addis, SW SE Sec. 34, Blk. 43, Twp. 2s, T.&P. Sur., building derrick.

Phillips 1-22 Embar, Sec. 6, Blk. 44, Twp. 2n, T.&P. Sur., T.D. 4,312 ft., testing after 1,000 gal. acid.

Loving County

H. C. McAuley 1 E. Hall, SE Sec. 60, Blk. 7, W.&N.W. Sur., T.D. 1,880 ft., straightening hole.

Sloan & Zook 1 T.&P. Trust, SW SE Sec. 37, Blk. 56, Twp. 1s, T.&P. Sur., 3¾ mi. NE of Tunstill gas well, 8¼-in. 2,350 ft., drilling 2,385 ft.

Menard County

Harry Baldwin 1 J. A. Leggett, 760 ft. from W and 900 ft. from S lines, Sec. 1, B.S.&F. Sur., drilling 1,132 ft.

Pecos County

Culbertson & Irwin 1 R. G. Heiner, NE NE Sec. 589, G.C.&S.F. Sur., Ordovician wildcat, show oil in upper Ellenburger lime, drilling 5,444 ft.

Schleicher County

Harold B. Opp 1 Jackson, Sec. 41, Blk. L.L., T.C. Sur., drilling 5,708 ft.

Reagan County

H. Schooler 1 R. A. Wolters, NE NE Sec. 51, G.C.&S.F. Sur., first report.

Reeves County

C. A. Kitsos 1 A. B. Burchard, SW Sec. 7, Blk. 58, P.S.L. Sur., Delaware test, spudded and S.D., drilling water well.

Roy Johnson 1 Perkins, Sec. 18, Blk. 7-C, P.S.L. Sur., T.D. 1,805 ft., last report.

J. T. Pemberton 1 fee, NE NE Sec. 2, Blk. 55, Twp. 7, T.&P. Sur., first report. Delaware lime test, 7,000 ft.

Sutton County

S. B. Roberts 1 George Allison, NW NE Sec. 44, Blk. K., G.H.&S.A. Sur.

Domain 1 G. S. Allison, SW NE Sec. 91, Blk. 9, T.W. N.G. Sur., Ellenburger lime test, S.D. 1,098 ft., last report.

Terrell County

Texas Consolidated Oil 1 Holmes, NE NE Sec. 14, Blk. 2-A, G.H.&S.A. Sur., 3,600-ft. test, location.

H. H. Sides 1 Rose, Sec. 15, Blk. 148, T.&St.L. Sur., rigging up spudder.

C. M. Thomasson 3 Bates-Graham, 600 ft. from N and 2,490 ft. from W lines, Sec. 30, Blk 1, I.&G.N. Sur., drilling 510 ft.

Ward County

Fitzpatrick & Slack 1 Wilson, Sec. 145, Blk. 34, H.& T.C. Sur., 1½ mi. SE of discovery well, tools lost in hole at about 4,700 ft, T.D. 4,925 ft., fishing.

Gulf 6 Wristen 1,997 ft. from SE and 1,989 ft. from NE lines, Sec. 18, Blk. 5, H.&T.C. Sur., deep Silurian test, digging pits.

Roeser & Pendleton, Inc., and Merry Brothers & Perini 1 Bird Hayes, 467 ft. from SE and SW lines, Sec. 164, Blk. 34, H.&T.C. Sur., ¼ mi. N of discovery gas well contract depth 5,200 ft., to Delaware sand, 10-in. 1,072 ft., drilling 2,450 ft.

J. E. Fitzpatrick 1 T. B. Pruit, SW SW Sec. 23, Blk. 1, W.&NW. Sur., first report.

NORTHERN WEST TEXAS

A wildcat test 3 miles northeast of the Waples-Platter area in Yoakum County, George Livermore 1 Ownby, Section 502, Block D, Gibson Survey, was formerly correlated low structurally on the anhydrite, however, lower markers have reassured the test of good structural position. The brown lime was topped at 4,330 ft., 25 ft. higher than 1 Waples-Platter, a small oil producer 3 miles southwest. It is also 54 ft. higher than a failure 4 miles to the northeast. The San Andres lime was topped at 4,689 ft., which is 45 ft. higher than in 1 Waples-Platter, a definite thinning between this and the previously checked marker. At last reports the test was drilling ahead below 4,855 ft.

In Borden County a new wildcat location has been made by M. L. Richards of Big Spring. It will be 1 Hale, SW Section 307, Block 97, H.&T.C. Survey, about a mile from the Scurry County line and less than 11 miles northwest of production in the Sharon field of Scurry and Mitchell counties. The contract depth is 3,200 ft.

NORTHERN WEST TEXAS COMPLETIONS

(24-hour ratings based on last 3 hours of 6-hour gage)

Dickens County

Wildcat: Bond D. Jones 1 Ford, top San Andres 982 ft., anhydrite 1,012 ft., salt 1,030 ft., San Angelo 1,800 ft., dry at 4,265 ft.

Gaines County

Seminole field: Amerada 2 Hahn, 788 bbl., natural, ½-in. choke, 5,145-5,350 ft.

Amerada 4 Turlin, 772 bbl., ½-in. choke, 2,000 gal. acid, 5,124-5,330 ft.

Humble 1 Champion, 641 bbl., natural, ½-in. choke, 5,093-5,325 ft.

Magnolia and Atlantic 7-195 H.&J., 357 bbl., natural, ½-in. choke, 5,130-5,243 ft.

Magnolia and Atlantic 5-217 H.&J., 411 bbl., natural, ½-in. choke, 5,188-5,307 ft.

Magnolia and Atlantic 15-219 H.&J., 432 bbl., natural, ½-in. choke, 5,100-5,248 ft.

Magnolia and Atlantic 9-251 H.&J., 443 bbl., natural, ½-in. choke, 5,160-5,277 ft.

Wasson field: Continental 7-X-48 Wasson, 1,551 bbl., open tubing, 12,000 gal. acid, 4,915-5,000 ft.

Cedar Lake field: L. C. Harrison 1 Gus White, 811 bbl., open tubing, 400-qt. shot, 4,605-4,769 ft.

Hockley County

Slaughter field: Bass & Dillard 5 Forehan, 1,170 bbl., 2-in. casing outlet, 8,000 gal. acid, 4,890-4,995 ft.

Mitchell County

Sharon Extension field: R. Anderson 1 Mills, 318 bbl., pumping, 410-qt. shot, 1,556-1,692 ft.

Scurry County

Sharon field: Blue Streak Oil 1 First National Bank, 120 bbl., open tubing, 554-qt. shot, 2,249-2,442 ft.

Yoakum County

Wasson field: Aloco Oil 8 Johnson, 691 bbl., open tubing, 730-qt. shot, 4,989-5,278 ft.

Aloco Oil 6 Walker, 745 bbl., open tubing, 700-qt. shot, 4,990-5,271 ft.

NORTHERN WEST TEXAS WILDCAT REPORT

Andrews County

Phillips 1-223 Embar, NE SW Sec. 7, Blk. 44, Twp. 2n, T.&P. Sur., preparing to drill.

Phillips 1 University-Drews, NW NE Sec. 32, Blk. 10, University Lands Sur., drilling 4,960 ft.

Phillips 2 Embar, NE SE Sec. 5, Blk. 44, Twp. 2n, T.&P. Sur., ¾ mi. N of Embar, drilling 5,278 ft.

Furham Pet. 1 Lockhart-Brown, Sec. 24, Blk. 42-A, P.S.L. Sur., top solid lime 4,155 ft., T.D. 4,700 ft., new contract depth 6,500 ft., preparing to start up.

Cochran County

Rhodes and Atlantic 1 Dean, C NE Tract 4, Lge. 89, Libscomb County School Lands, T.D. 5,150 ft., P.B. 5,112 ft., treated with 1,000 gal. acid, shot 210 qt., P.B. to 5,099 ft., testing water shutoff.

Gaines County

Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., logged new pay about 6,610 ft., tight well, application filed to drill to 11,000 ft.

W. E. Smith 1 fee, in Lots 11 and 12, Blk. 38, in Seminole townsite, 1¼ mi. E of Seminole field, building derrick.

King County

J. B. Cunningham 1 F. W. Thormann, NE NE W. C. Browder Sur., drilling 1,680 ft., 3,000-ft. test.

Mitchell County

Peck & Croft 1 Jack Smith, 2,173 ft. from N and W lines, Sec. 19, Blk. 26, T.&P. Sur., T.D. 275 ft., setting 13-in. casing.

Yoakum County

George Livermore 1 Ownby, NE NE NE Sec. 502, Blk. D, Gibson Sur., top San Andres lime 4,690 ft., drilling 4,855 ft.

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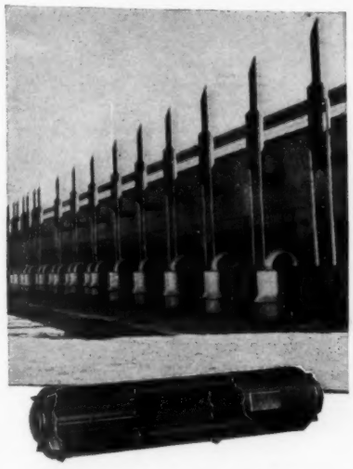

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TEXAS PANHANDLE

AMARILLO, Tex., Jan. 20.—The Panhandle field counted six new oil completions and one well drilled deeper for a new initial. Locations dropped from 16 the previous week to 11 for the past 7 days.

Rock Oil Co.'s test started last week just outside the city limits of Pampa is expected to start a townsite drilling program should commercial production be encountered. It is just 100 yd. west of the limits of the city and is about ¼ mile from nearest production. It is drilling below 2,000 ft. Although Pampa is geographically in the center of the large Panhandle field, there are no wells within the limits of the city, production being only about ¼ mile away.

TEXAS PANHANDLE COMPLETIONS

(24-hour gages, pumping)

Carson County

Skellytown field: J. M. Huber Corp. 6-R S. B. Burnett, 55 bbl., 3,092-3,105 ft., P.B. from 3,105 ft., old well drilling deeper.

Gray County

Pampa field: Cities Service 15 A. J. Culler, 54 bbl., 3,178-3,247 ft.
Moran Brothers 6 Skidmore, 164 bbl., 3,140-3,280 ft.
Ryan Consolidated 1-B Barrett, 41 bbl., 3,260-3,309 ft.

Hutchinson County

Stinnett field: Gulf 10-B Whittenburg, 225 bbl., 2,883-3,001 ft.
Borger field: Stanolind 22 Haile, 216 bbl., 3,003-58 ft. Phillips 47 Cockrell ranch, 302 bbl., 2,926-3,020 ft.

SOUTHEAST NEW MEXICO

HOBBS, N. M., Jan. 20.—Wildcat activity in Eddy County where several new exploratory holes were started the past week, centered attention in the Southeast New Mexico district. New completions and locations continued at a low ebb the past week with only two oil wells and two failures listed for Eddy County and no completions for Lea County. Each of the two counties received one new location, while a previously quit wildcat in Eddy was reentered for deepening.

The deepening project was Gordon M. Cone of Lovington 1 Hare, located in the NW NW NE 14-16s-28e. Started some time ago but never carried to its original contract depth, it is now drilling below 1,746 ft.

New wildcat for Eddy County was Suddreth and associates 1 Neil H. Wills, located 1,980 ft. from the south and east lines of 14-20s-28e, about 6 miles west of the Getty field and 3 miles southwest of an outpost producer for the field, Getty 2 Cook & Ironside.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

Artesia field: Sam Sanders 10 Berry, NE NE NW 22-17-27, H.F.W. 447-52 ft., dry at 500 ft.
Tignor-Etz-Keyes 7-A Keyes, NW NW SW 10-17-28, flowed 15 bbl., ¾-in. choke, 50-qt. shot, 1,947-58 ft.
Grayburg-Jackson field: Murchison-Closuit 2-B State, NW SW SE 16-17-31, flowed 65 bbl., open tubing, 3,500 gal. acid, 3,590-3,645 ft.
Dayton area: Brainard-Guy 1 Hill, SW NE SW 6-18-27, 500-qt. shot at 1,875 ft., flowed water, dry at 1,902 ft.

SOUTHEAST NEW MEXICO WILDCAT REPORT

Chaves County

L. E. Elliott 1 State.....NW NE 16-11-31
10¾-in. 555 ft., drilling 560 ft.
Roxana Oil 1 Maull.....NE NW 11-12-25
S.D. 460 ft.
A. F. Pierce 1 Franks.....SE NW NW 17-9-25
Show oil 862-67 ft., treated 1,000 gal., T.D. 938 ft., S.D.
Helmes-Martin 1 Stephens.....C NW NE 22-15-29
Old well drilling deeper, show oil 3,112-30 ft., T.D. 3,165 ft., cleaning out to drill deeper.
H. Steinberger 1 Headley.....NW SW 26-14s-29e
T.D. 3,405 ft., sulfur water 3,400-05 ft.
R. I. Wilson 1 L. B. Brown.....C NW SW 29-11-23
S.D. 235 ft.

Eddy County

G. M. Cone 1 Hare.....NW NW NE 14-16-28
Old well drilling deeper, drilling 1,746 ft.
A. & M. Pet. 2 State.....NW SE 15-21-27
Drilling 581 ft.
Mac T. Anderson 1 Brainard.....NE NE 28-18-27
S.D. 2,050 ft.
Bedingfield & Walker 1 Seale.....SE SE SE 10-20-27
Show oil and gas 1,552-70 ft., drilling 1,599 ft.
Jack Harris Josey.....SW SE 19-20-23
T.D. 643 ft.
Jones & Yates 1 Everest.....NE SE 15-18-26
270-qt. shot 1,934-84 ft., and 670-qt. shot 1,485-1,710 ft., casing collapsed, flowing sulfur water.
S. P. Yates 1 Taylor-Ross.....NW SW 22-19-25
8¼-in. 432 ft., drilling 1,075 ft.
Fulton 1 Johnson.....NW SE 22-19-27
T.D. 1,849 ft., P.B. 1,645 ft., 230-qt. shot, 1,752-1,645 ft., filled 400 ft. with oil and water after being cleaned out, 5⅞-in. casing at 1,442 ft., swabbed 27 bbl. oil, 5 hr., running rods and tubing.
Truett & Tallmadge 1 Rudahl.....NE SE 2-20-24
S.D. 1,842 ft.
Dooley & Haynes 1 Martin.....SE NW 9-18-25
5½-in. at 975 ft., S.D. 1,000 ft

Otero County

Otero Oil 1 State.....SE NW 5-22-10
Reaming 8¼-in. at 1,190 ft., T.D. 1,240 ft.
R. H. Ernest 1 Located Land Co.....SE SE 20-25-7
T.D. 3,843 ft.

By
STAFF CORRESPONDENT

Successful Trenton Well in Salem Starts Many Drilling

MATTOON, Ill., Jan. 20.—Developments in the completion of Paul Rossi 8 Brooks, SW NE SW 29-2n-2e, first Trenton producer in the Salem field, occupied the spotlight of the Illinois oil industry during the week. Although the well has not yet been officially gaged, it swabbed at an estimated rate of 200 bbl. a day during the early part of the week and, after an acid treatment, was swabbing approximately 12 bbl. an hour.

The acceptance of this well as a sure producer already has revived drilling in the Salem field and the renewed activity is expected soon to spread over the entire field. At the beginning of the week, 20 operations were under way. Of these, 15 were drilled to the Trenton during the week end by the Texas Co., the Magnolia Petroleum Co., and W. C. McBride, Inc., while five were being deepened to the new pay formation. All of the drilling is being done with cable tools.

With the exception of the Trenton tests, there has been little activity in the Salem field during the past few months because development of the field's pay formations had practically been completed. The crude production of this field, Illinois' largest producing area, has declined steadily since March when the yield from the Devonian lime began to drop. Until discovery of production in the Trenton lime, the Devonian was the deepest producing formation in the field. Other producing formations are the McClosky and St. Louis limes, and the Benoist and Aux Vases sands.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: East Calvin	10	1,379	27,538
Enterprise	2	292	6,175
Hoodville	3	506	9,239
Louden	4	846	6,208
Mount Carmel	2	175	4,528
West Liberty	1	456	2,833
Other pools	9	1,124	23,602
Wildcats	4	689	11,086
Dry holes: Fields*	4	.....	11,131
Wildcats	11	.....	25,075
Total	50	.....	127,415
Recompletions	4	439	.....

*Sandoval 2, Enterprise 1, North Boos 1.

Activity throughout the state dropped during the past week as 51 wells were completed. Of these, 35 were oil wells and 15 were dry holes. Total initial production for the 35 oil wells was 5,467 bbl., a little more than half the average weekly initial production for the past few weeks. This drop was due to the fact that no large producers were completed in the West Liberty pool. During the past few weeks, four or five wells which have averaged over 1,000 bbl. per well have been completed each week in this field to maintain the high initial productions of the state. Activity in the other areas of the state remained close to normal during the week.

New Pools

Two new pools were opened in Illinois during the past week and indications were that several more will be opened in the next few weeks. In Edwards County Tide Water-Associated 1 Gawthorp, NE NE SE 13-1s-10e, opened a new pool when it flowed naturally at the rate of 17 bbl. an hour. The well is being acidized in the McClosky at 3,266-74 ft. and 3,274-48 ft. The new pool is 6½ miles from other oil production.

The other new pool was opened in Marion County about 1½ miles east of Patoka, where Obering and Phillips 1 Thalman heirs swabbed 45 bbl. of oil in 9 hours. This well, producing from the Cypress sand at 1,356-60 ft., is about 1¾ miles from production in the Patoka field and lies on a separate structure. The well is to be put on pump.

ILLINOIS COMPLETIONS

Clinton County

Wildcat: McTrumbull 1 Dillman, NE SE NE 12-2n-5w, dry, elev. 470 ft., lower Mississippian 1,109 ft., T.D. 2,170 ft.

Edwards County

Albion pool: Tuesday 3 Horton, NE NW SE 13-2s-10e, pumped 48 bbl., 3,000 gal. acid, McClosky 3,147-55 ft., 3,202-08 ft., T.D. 3,245 ft.

Effingham County

Wildcat: Hinkle 1-A Townsite, SE SE NW 22-6n-5e, swabbed 5 bbl. an hr., natural, pumped 80 bbl. in 8 hr., 500 gal. acid, McClosky 2,498-2,502 ft., T.D. 2,505 ft.

Fayette County

Louden pool: Magnolia 36 T. C. Clow, SW NE NW 5-7n-3e, pumped 402 bbl., 20-qt. shot, Cypress 1,403-52 ft., Paint Creek 1,475-80 ft., 20-qt. shot Benoist 1,488-96 ft., T.D. 1,498 ft.

Carter 2 M. Scott, NE NE NE 20-8n-3e, pumped 72 bbl., 20-qt. shot, Cypress 1,514-39 ft., 10-qt. shot, Paint Creek 1,585-95 ft.

Carter 1 A. M. Wood, SE NE NE 13-8n-3e, pumped 180 bbl., 15-qt. shot, Cypress 1,508-17 ft., T.D. 1,521 ft.

St. James pool: Ohio 13 C. T. Williams, SW SE NW 36-6n-2e, pumped 29 bbl., 8-qt. shot, Cypress 1,599-1,607 ft., T.D. 1,608 ft.

Wildcat: E. Turner 1 Pruett, SE SW NW 7-5n-3e, dry, Glen Dean 1,487 ft., Cypress sand 1,641 ft., Paint Creek stray 1,715 ft., T.D. 1,935 ft.

Nat. Pet. 1. Heckathorn, NW SW SE 22-5n-1e, dry, Menard 1,153 ft., Glen Dean 1,349 ft., Cypress 1,509 ft., Benoist 1,654 ft., Ste. Genevieve 1,778 ft., T.D. 1,905 ft.

Angelo-Twelve Oil 1 Oates, N½ SE NE 13-4n-1w, dry, Chattanooga 2,856 ft., Devonian 2,942 ft., T.D. 3,056 ft.

W. H. Brown 1 Lockard, SE SE SE 29-8n-2e, dry, elev. 543 ft., T.D. 1,760 ft.

Gallatin County

Wildcat: Snowden & McSweeney 1 Frey, SE SE NW 19-8s-10e, dry, base Pennsylvanian 1,555 ft., Menard 1,912 ft., Vienna 2,077 ft., Glen Dean 2,231 ft., Golconda 2,278 ft., Cypress 2,460 ft., Benoist 2,630 ft., Aux Vases 2,650 ft., Ste. Genevieve 2,669 ft., T.D. 2,956 ft., P.B. 2,774 ft., 2,147 ft. and 1,960 ft.

Cameron 1 Rister, NE NE NW 4-8s-8e, pumped 317 bbl., 30-qt. shot and 20-qt. shot, Palestine 1,679-1,704 ft., T.D. 1,704 ft.

Hamilton County

Hoodville pool: Exchange 12 Friel-B, SE NE SW 34-3s-6e, pumped 105 bbl., 25-qt. shot 2,966-77 ft., Benoist 2,958-87 ft., Ste. Genevieve 3,093 ft., T.D. 3,203 ft.

Kingwood 6 Morris, NW NW SW 35-3s-6e, pumped 299 bbl., 14-qt. shot, Aux Vases 3,033-44 ft., 17-qt. shot, Benoist 2,937-60 ft., T.D. 3,034 ft.

Egyptian 1 Austin, SW NW NE 34-5s-6e, pumped 102 bbl. oil and 60 bbl. water, 9-qt. shot, Benoist 2,978 ft., T.D. 3,002 ft., P.B. 2,995 ft.

Wildcat: Kingwood 1 Lasswell, W½ NE SE 31-6s-6e, dry, Kincaid 1,927 ft., Menard 2,400 ft., Glen Dean 2,637 ft., Cypress 2,920 ft., Benoist 3,124 ft., Aux Vases 3,217 ft., McClosky 3,338 ft., T.D. 3,433 ft.

Jasper County

West Liberty pool: Pure 3 T. W. Dickerson, W½ SE NW 17-5n-10e, flowed 456 bbl., McClosky 2,798-2,808 ft., T.D. 2,833 ft.

North Boos pool: Pure 1 W. G. Murvin, NE NE SE 17-6n-10e, old well worked over, old T.D. 2,921 ft., 4,000 gal. acid, 60-qt. shot and 2,000 gal. acid, pumped 8 bbl. December 24, now dry.

Marion County

Sandoval pool: Big Four 2 A. Sherman, NE NW NW 9-2n-1e, dry, Devonian 2,942 ft., acid, T.D. 3,001½ ft.

Martin et al 1 Robinson, SW SE SW 4-2n-1e, dry, St. Peter 4,978 ft., T.D. 5,023 ft.

Montgomery County

Wildcat: Ben Turelli & Hempen 1 J. Ahrling, NE SE NE 25-10n-5w, dry, T.D. 150 ft.

St. Clair County

Dupo pool: C. S. Wise 4 Tarleton, N½ NW NE NE 33-1n-10w, pumped 166 bbl. oil and 700 bbl. water, Trenton 645 ft., T.D. 704 ft.

Richland County

Dundas pool: Pure 1 Hoel Consol., E½ SW NE 7-4n-10e, flowed 219 bbl., 5,000 gal. acid, McClosky 2,920-30 ft., T.D. 2,940 ft.

Wayne County

Enterprise pool: Pure 1 A. Feller-A, E½ SE NW 8-1n-8e, dry, Glen Dean 2,505 ft., Hardinsburg 2,520 ft., Ste. Genevieve 2,993 ft., T.D. 3,107 ft.

Pure 8 W. Hubble A, W½ NE NW 32-2n-8e, pumped 226 bbl., 5,000 gal. acid, McClosky 3,049-55 ft., T.D. 3,090 ft.

Pure 1 F. Hassleton, SE NE SW 29-2n-8e, pumped 66 bbl. oil and 129 bbl. water, 5,000 gal. acid, McClosky 3,054-57 ft., T.D. 3,085 ft.

Mill Shoals pool: Texas 5 A. J. Poorman, NE NW SE 19-3s-8e, pumped 167 bbl., 25-qt. shot, Aux Vases 3,210-55 ft., T.D. 3,260 ft.

Boyleston pool: J. C. Meyers 1 W. H. Sprague, SE NW SE 4-2s-7e, flowed 200 bbl., 3,000 gal. acid, McClosky 3,221-29 ft., 3,234-53 ft., T.D. 3,270 ft.

Wildcat: Lain 1 B. K. Felix, E½ SE NE 9-3s-8e, pumped 160 bbl. oil and 45 bbl. water, McClosky 3,432-40 ft., T.D. 3,518 ft.

Hudson 1 L. Lowe, S½ SE NE 5-1s-6e, dry, base Pennsylvanian 2,055 ft., Menard 2,385 ft., Glen Dean 2,595 ft., Golconda 2,695 ft., Barlow 2,795 ft., Benoist 3,006 ft., Aux Vases 3,075 ft., Ste. Genevieve 3,285 ft., T.D. 3,320 ft.

Nat. Pet. 1 H. States, W½ SE SW 36-1n-6e, dry, Paint Creek 2,947 ft., Benoist 3,029 ft., Aux Vases 3,071 ft., Ste. Genevieve 3,138 ft., T.D. 3,330 ft.

Wabash County

South Griffin pool: Longhorn 6 Helm, SW NE NE 27-3s-14w, pumped 160 bbl., 4,000 gal. acid, McClosky 2,879-95 ft., 30-qt. shot, Aux Vases 2,772-87 ft., T.D. 2,896 ft.

Keensburg pool: Smokey 9 Woodard, SE SW NE 9-2s-13w, pumped 60 bbl., 30-qt., shot Cypress 2,414-24 ft., T.D. 2,428 ft.

Mt. Carmel pool: O'Meara 2 Utter, SW SW NE 17-1s-12w, flowed 25 bbl. oil and 1,500,000 cu. ft. gas, 20-qt. shot, Cypress 2,050-68 ft., T.D. 2,140 ft., P.B. 2,068 ft.

O'Meara 3 Gould, SE SE NW 17-1s-12w, flowed 150 bbl., McClosky 2,370-88 ft.

White County

East Calvin pool: W. Duncan 1 Bramlett, NE SW SW 17-4s-14w, location abandoned.

Tipton 1 Boltinghouse, NW SE NE 17-4s-14w, pumped 135 bbl., 80-qt. shot, Paint Creek 2,666-79 ft., Benoist 2,690-2,710 ft.

Ryan 14 Bramlett A, S½ S½ S½ 17-4s-14w, pumped 100 bbl., 40-qt. shot, Cypress 2,581-2,620 ft., T.D. 2,712 ft.

Ryan 13 Bramlett A, N½ S½ S½ 17-4s-14w, pumped 100 bbl., 40- and 15-qt. shots 2,698-2,720 ft., T.D. 2,720 ft.

Ryan 12 Bramlett A, W½ SW SE 17-4s-14w, pumped 100 bbl., 40-qt. shot, Paint Creek 2,678-94 ft., Benoist 2,704-20 ft., T.D. 2,723 ft., P.B. 2,720 ft.

Ryan 2 Bramlett A, SE SW SE 17-4s-14w, pumped 138 bbl., Cypress 2,575 ft., T.D. 2,595½ ft.

Duncan 5 Hughes, SW SE SE 17-4s-14w, pumped 120 bbl., 30-qt. shot, Benoist 2,700-16 ft., T.D. 2,721 ft.

Pure 6 G. P. Calvin B, SE NW NW 16-4s-14w, flowed 442 bbl., 100-qt. shot, Aux Vases 2,825-65 ft., T.D. 2,865 ft.

W. Duncan 6 C. C. Hughes, SE NE SE 17-4s-14w, pumped and flowed 200 bbl., 40-qt. shot 2,708-20 ft., Benoist 2,689 ft., T.D. 2,720 ft.

Pure 10 Potter, SE SW NW 9-4s-14w, pumped 128 bbl., 40-qt. shot 2,697-2,711 ft., 88-qt. shot 2,808-36 ft., T.D. 2,836 ft.

Mabee O. & G. 2 O. Smith, NE SW SW 4-4s-14w, pumped 16 bbl., 20-qt. shot, Cypress 2,549-64 ft., McClosky 2,923-26 ft., T.D. 2,935 ft., P.B. 2,561 ft.

Springerton pool: A. W. Gerson 2 C. H. Belva, SW NE NW 6-4s-8e, pumped 75 bbl., 30-qt. shot, Aux Vases 3,232-51 ft.

Wildcat: H. Hubbard 1 Fox, SE NW SW 20-3s-14w, dry, Benoist 1,055-60 ft.

D. Duncan 1 Zeller, SE NE NE 34-3s-5e, pumped 132 bbl., McClosky 3,337-59 ft.

ILLINOIS DRILLING REPORT

Clark County

Sherritt et al 1 Jeffers ..... SE NE SE 31-11n-13w
Drilling 1,200 ft.

Bancroft et al 1 Aetna Life ..... NW SW SE 7-11n-14w
Base Pennsylvanian 270 ft., Salem 353 ft., Osage 470 ft., S.D. 863 ft.

Shawver & Gallatin 1 Howard ..... SE SE NE 25-10n-14w
60-qt. shot 1,340-50 ft., 800 ft. fluid in hole, mostly oil.

Clinton County

Kreigh 1 Kampworth ..... NE NW NW 8-1n-3w
Drilling 957 ft.

J. F. Ashoff 1 Lampen ..... NW NW NW 16-1n-2w
Rigging up standard tools.

Hughes 2 Holman ..... NE SW SE 10-2n-1w
S.D. 665 ft.

De Kalb County

J. E. Milburn 1 Eraas ..... NW NW SE 22-38n-3e
S.D. 585 ft.

Douglas County

Pogue et al 1 Owens ..... NW SW NW 26-15n-7e
S.D. 775 ft.

Edwards County

J. D. Barnes 1 Hodgson ..... N½ NE 1-2s-10e
S.D. 2,900 ft.

H. H. Weinert 1 A. Wick ..... NW NW NW 24-2s-10e
Set 10-in. 83 ft., drilling 890 ft.

Ford County

Nelson et al 1 Erp ..... SW NW SE 19-24n-7e
S.D. 2,963 ft.

Franklin County

E. S. Adkins 1-B Orient Coal Co. SE NE NW 12-7s-2e
Tar Springs 2,039 ft., drilled out to 2,054 ft., set 7-in. 2,054 ft.

Vanderbark 1 U. S. Guaranty ..... NW SW SE 34-7s-4e
S.D. 3,193 ft.

E. S. Adkins 1 Orient Coal Co. ..... NE SW SE 24-6s-2e
Swabbed 416 bbl., 400 bbl., 394 bbl., 396 bbl., 428 bbl., pumped 17 bbl. an hr. testing.

(Continued on Page 86)

NORTH CENTRAL TEXAS

By
R. MARNE SANFORD

Wildcatters Starting Deep Tests at Scattered Points

WICHITA FALLS, Tex., Jan. 20.—New wildcat locations throughout the North Texas district continued to lead the development of the area as five new wildcats were staked this week. New development in many of the recently opened deep Strawn and Bend fields throughout the district during the past year is progressing at a steady pace.

As a deep exploratory test in the old 3,900-ft. Worsham field of eastern Clay County, Gulf Oil Corp. has staked 1 G. W. Scaling. The old Worsham field is considered by geologists to be included on the estimated 52,000-acre structure now embracing the two recent discoveries, Ringgold in western Montague County, and Hapgood just north of the Worsham field. It was predicted last summer and early in the development of these two above-mentioned fields that several new areas and various pay levels would be opened on the structure. This prediction was borne out the past few months when two pay horizons were added in both the Ringgold and Hapgood fields. Now deeper production is being sought in the old Worsham field itself. The Gulf location is 330 ft. from the north and 990 ft. from the west lines of Section 3, T.&N.O. Survey and will seek production either from the lower Bend conglomerate or the deep Ordovician level.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Hull-Silk field	2	970	5,778
Throckmorton field	2	5	1,169
Other fields	5	2,595	14,508
Dry holes: Olney field	3	.....	3,026
Freiberg field	2	.....	2,756
Wildcats	3	.....	9,342
Archer field	1	.....	973
Total	18	.....	37,552

West Central Texas

Oil wells	3	311	5,060
Gas wells	1	*4.15	2,247
Dry holes	4	.....	9,028
Total	8	.....	16,335

*Million cu. ft.

As a ½-mile south outpost to the rapidly developing Antelope field (formerly called Henderson), Shell Oil Co., Inc., has stake its 1 L. S. Wright, NE Section 2625. The field was opened the latter part of December in 1939 and the discovery company has completed 11 producers in the field. Only one dry hole has been drilled, the L. T. Burns failure in Section 2617, about ¾ mile northwest of production in the field.

Baylor, Cooke, and Foard counties all counted new wildcat locations during the week. As a deep 4,500-ft. test in Baylor County, L. T. Burns has set surface casing and is preparing to drill ahead at his 1 fee, Section 73, T.&N.O. Survey, about 4 miles southwest of Dundee in northwestern Archer County. The location was made about 10 days ago and work was started the past week.

In Cooke County R. B. Farris of Fort Worth has staked 1 F. D. Houston, an 1,800-ft. wildcat located about 8 miles west and slightly south of Valley View. It is in the northwest corner of the southwest 80 acres of the 373-acre tract in the Charles DeMorse Survey.

Foard County's new site is Texas 1 F. Harabel, NW Section 431-A, H.&T.C. Survey, northwest of the old Johnson field. Contracted to 4,500 ft., the wildcat is on a block of 5,000 acres which the company recently filled in with the purchase of several scattered tracts.

Archer County

As a new test in the Scotland area of eastern Archer County, Deep Oil Development Co. has staked 1 Moer, a 4,500-ft. location in the southwest quarter of Lot 21, Block 3, Clark & Plumb subdivision. The test is about two locations south of the deep discovery in 1939 by Adams Oil & Gas on the Moer tract. The discovery drilled to 4,165 ft. and was plugged back to 4,141 ft. for a small producer from the lower Strawn. Deep Oil Development Co. drilled a 4,171-ft. failure as a north offset to the discovery. The 4,500-ft. contract of the new test will carry it about 350 ft. deeper than the other two tests in the area.

Rapid development is under way for the recently opened Coleman field in Archer County northwest of Scotland. The second and third producers for the field were brought in the past week. Shell Oil Co., Inc., discoverer of the field, drilled in 1-B Coleman, north offset to the discovery well and was washing to bottom at 5,050 ft. preparatory to taking initial gages. Located in Block 74, A.T.N.C.L. Survey, it topped the Caddo lime at 4,979 ft. and drilled saturation and porosity from that depth to 5,030 ft. The 4½-in. casing is cemented on top of the lime.

The other producer in the new field, Southern Petroleum Exploration Co., has gaged 1-A Wilson, west of the discovery, at 130 bbl., pumping, from saturation from 5,166-5,216 ft. This pay is considerably lower than that of the discovery well and the second producer and indicates a low well, structurally, since it is correlated to be the same Caddo zone found in the other wells.

NORTH TEXAS COMPLETIONS

Archer County

Hull-Silk field: Cox & Hammon and O. T. Anderson, 40 bbl. an hour, ½-in. choke, 4,355-4,415 ft.
B. L. Ligon 11 J. A. Little B, 10 bbl. daily, pumping, 1,360-63 ft.
South Mankins field: Roeser & Pendleton 1 T. B. Wilson, 169 bbl. in 3 hr., ¾-in. choke, 5,000 gal. acid, 4,643-98 ft.
Archer field: George Kesterson, Jr., 3 Herron, dry at 973 ft.

Baylor County

Seymour field: Featherstone, Spragins & Art 1 Green, 41 bbl. in 5 hr. with 10 bbl. salt water, 3,047-51 ft.

Jack County

Wildcat: Paul P. Steed 1 Haag, Nancy Overby Sur., Abst. 452, dry at 3,396 ft.

Throckmorton County

Throckmorton field: W. Neustadt 3 McKeichon, 2 bbl. oil and ½ bbl. water, pumping, 718-19 ft.
W. Neustadt 4 McKeichon, 3 bbl., natural, pumping, 425-50 ft.

Wichita County

Wildcat: Akin, Dimock & Costley 1 Dodson, W. H. Anderson Sur., Abst. 1, dry at 1,370 ft.
Freiberg field: Harper & Knappenberger 1 Ramming, dry at 1,405 ft.
T. A. Norwood 1 C. Guyer, dry at 1,351 ft.
Wichita field: O. Kemp 1 Heiserman, 10 bbl. oil and 20 bbl. water, pumping, natural, 1,325-34 ft.

Wilbarger County

Wildcat: Consolidated Oil 1 Pollan, junked and quit at 4,576 ft.
Wilbarger field: Pois & Schultz 4 King, 25 bbl., pumping, 1,625-40 ft.

Young County

Olney field: George Keith 3 Rogers, dry at 965 ft.
L. T. Burns 3 Larrimore, dry at 900 ft.
Henry Craig 2 Schlegel, dry at 1,161 ft.
Knight field: Tex-Tor 3 Mosely, 673 bbl., 16 hr., flowing, natural, 3,781-85 ft.

NORTH TEXAS WILDCAT REPORT

Archer County

W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., 60-qt. shot 5,149-64 ft.; cleaning out.
W. B. Omohundro 1 Browning, 467 ft. from S and E lines, Sec. 7, G.E.L. Sur., top Caddo lime 5,130 ft., 5½-in. 5,127 ft., T.D. 5,147 ft., perf. casing 4,040-50 ft., tested salt water, S.D.O.
Shell 1-B Coleman, 330 ft. to S and E lines of Lot 1, Sec. 74, A.T.N.C.L. Sur., top Caddo lime with saturation 4,979 ft., T.D. 5,050 ft., prep. test.
Southern Pet. Exp. 1 Wilson A, 330 ft. W from railroad and 330 ft. from N line, Lot 4, Sec. 73, A.T.N. C. L. Sur., tight well, top Caddo 5,161 ft., 5½-in. 5,162 ft., show oil in lime 5,161-5,200 ft., pumped 130 bbl. per day.
Walter Gant 1 Hunter, SE NW Sec. 7, Blk 1, H.&T.C. Sur., top Ellenburger 5,370 ft., set 7-in. at 5,370 ft., T.D. 5,391 ft., drilling plug.
W. B. Omohundro 1 Coleman, Blk. 52, Madison County School Lands Sur., S.D.O. 5,959 ft.
Gibson & O'Donohoe 1 Jentsch, 330 ft. from N and E lines, H. Jentsch Sur., Abst. 995, T.D. 4,806 ft., perf. casing 4,171-90 ft., tested water, cemented perf., W.O.C.
Sam Kruger 1 Turbeville, 450 ft. from E and 389 ft. from S lines, NW Sec. 170, Robert Carson subd., 1,600-ft. test, drilling 1,270 ft.
King Oil 1 Taylor, Lot 1, Sec. 13, A.T.N.C.L. Sur., top Ellenburger 4,960 ft., show oil 4,995-5,020 ft., 5½-in. set 4,970 ft.
E. C. Harlin 1 Waggoner, 150 ft. from S and W lines, Sec. 30, Clark & Plumb subd., T.D. 4,942 ft., making electrical survey.
White & Duncan 1 Snyder, 1,600 ft. from W and 750 ft. from N lines Lot 21, Thomas Toby Sur., Abst. 643, S.D.O. 750 ft.
H. F. Smiley 1 Larr, SW NW Sec. 136, H.S. of C.R. Sur., 1,400-ft. test, location.
Adams Oil & Gas 1 Powell, SE Lot 14, Sec. 1, S.P.R.R. Sur., Abst. 406, 5,200-ft. test, spudded and set surface casing.

Baylor County

Hattie B. Madden 2 J. J. James, Sec. 150, T.&N.O. Sur., show oil 1,352-63 ft., lost drill pipe at 2,308 ft., S.D.
Rogers & Lanfair 1 Howe, J. Howe Sur., Abst. 572, show oil 1,445-52 ft., S.D.O. 3,115 ft., T.D.
L. T. Burns 1 Burns, Sec. 73, T.&N.O. Sur., 4,500-ft. test, surface casing set, prep. drill ahead.

Clay County

Carlos Wagner 1 L. C. Thaxton, Sec. 2, T.&N.O. Sur., 6,500-ft. test, rigging up rotary.
Petroleum Producers 1 O. O. Ross, Sec. 8, J. Wyont Sur., Abst. 902, T.D. 5,584 ft., pumped 40 bbl. oil and 40 bbl. water in 24 hr. after 5,000 gal. acid.
Bridwell Oil 1 W. H. Myers, C. Thompson Sur., Abst. 444, 5,500-ft. test, location.

Denton County

Amon G. Carter 1 W. P. and A. P. Allen, S. Westbrook Sur., top Caddo 7,650 ft., drilling 8,149 ft.

Grayson County

Texas Co. 1 Hutchinson, Samuel Stewart Survey, drilling 5,360 ft.

Hood County

W. G. Martin 1 W. G. Thorman, E. cor. of 2,956-acre ranch, F. F. Anderson Sur., 5,000-ft. test, spudded and S.D.
Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, T.D. 1,180 ft.

Jack County

Continental 1 Robertson, M. J. Swan Sur., Abst. 1650, drilling 5,507 ft.
R. A. Conkling 1 M. Hoffle, A. James Sur., Abst. 318, 3 mi. S of Antelope, 3,500-ft. test, T.D. 3,108 ft., fishing casing.
Rathke Oil 1 Moseley, J. Harrison Sur., Abst. 259, 1,500 M.c.f. gas 4,645-50 ft., S.D.O. 5,340 ft.
K. N. Davis 1 Jones, NW cor. E½ Sec. 2555, T.E.&L. Sur., 1 mi. SE Perrin, 2,500-ft. test.
Noah Davis 1 Rankin, E½ Sec. 2555, T.E.&L. Sur., moving in materials.
Three Bee Investment Co. 1 Armstrong, 700 ft. from S and 1,200 ft. from W lines, Sec. 2, W. P. Blake Sur., Abst. 1598, 3,300-ft. test, 6⅝-in. 3,031 ft., show oil 3,031-44 ft., testing.
Harper-McClintock 1 Kinder, 1,400 ft. from E and 467 ft. from N lines, Sec. 2667, T.E.&L. Sur., drilling 735 ft.
O. J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines, H. C. Ayers Sur., Abst. 4, S.D. 3,505 ft. after electrical survey.

Parker County

Higginbotham 1 Gilbert, T.&P. Sur., Abst. 1958, T.D. 4,800 ft., fishing.

Montague County

Walter Gant 1 Will Laird, R. T. Millard Sur., Abst. 470, 7 mi. W of Sunset, T.D. 6,651 ft., P.B. to 6,596 ft., perf. casing 4,865-73 ft., swabbing unit broke, S.D.
T. F. Hunter 1 Fatheree, L. S. Gilliland Sur., 3 mi. W Illinois Bend, 6,000-ft. test, T.D. 5,043 ft., P.B. 3,394 ft. and set 6⅝-in. casing at 3,384 ft., testing show oil.
Benson & Benson 1 Joe Benton, Abel A. Lewis Sur., 2 mi. SE of Ringgold field, top Caddo lime 5,718 ft., T.D. 6,213 ft., P.B. 5,840 ft. to test conglomerate 5,812-30 ft.
J. G. Hammond 1 Jester, 84-acre tract in E Wingate Sur., Abst. 835, 2 mi. W Mallard, top Caddo lime 6,282 ft., S.D. 6,505 ft.
Sinclair Prairie 1 W. G. Hawkins, 631 ft. from N and 330 ft. from E lines of farm in Sec. 17, H.&T.C. Sur., 3 mi. SE of Ringgold, drilling 4,010 ft.

Tarrant County

Bruce Sullivan 1 W. C. Putnam, 200-acre tract in Milley Gilbert Sur., S.D.O., may deepen, T.D. 6,512 ft.

Throckmorton County

Homer Moore and J. E. Dodson 1 J. O. Crump, Blk. 956, T.E.&L. Sur., location.
Humble 1 Allie McKnight, 1,100 ft. from N and 660 ft. from E lines Sec. 2, D.L.&C. Sur., Abst. 1264, 5,000-ft. test, location.

Wichita County

Big Six Oil 1 Edmonson, 150 ft. from N and W lines, Sec. 13, Red River Lands subd., drilling 1,472 ft.
Fred Browning 1 W. L. Warren, 996 ft. from N and 330 ft. from W lines, Sec. 32, W.V.F.L. Sur., S.D. 4,001 ft., prep. P.B. and test show oil 1,760-72 ft.
Golding & Cochran 1 D. R. Preston B, 2,970 ft. from N and 990 ft. from W lines, Sec. 26, Blk. 7, H.&T.C. Sur., S.D. 4,083 ft.
Akin, Dimock & Costley 1 Dodson, 1,470 ft. from W

and 150 ft. from S lines, Dodson farm in W. H. Anderson Sur., Abst. 1, 1,350-ft. test, location.
King Oil 1 Ancell, 330 ft. from N and E lines of L. C. Gibbs Sur., Abst. 390, 4,000-ft. test, show oil 3,600-03 ft., 6⅝-in. 3,600 ft., testing.
R. D. Dorian 1 Ancell, SE Sec. 36, Blk. 5, H.&T.C. Sur., 4,000-ft. test, location.

Wilbarger County

W. H. Gant 1 Mock, Sec. 23, Blk. 11, H.&T.C. Sur., 6,000-ft. test, S.D.O. 425 ft.
Big Six Oil 1 Morris, Sec. 3, Blk. 14, H.&T.C. Sur., show oil 2,895-2,907 ft., 7-in. 2,895 ft., T.D. 2,905 ft., testing est. 60 bbl. oil per day, still testing.
Ray Brothers 1 Henry Streit, 72-acre tract in S. N. Gosnel Sur., Abst. 1231, 1,800-ft. test, fishing 1,265 ft.
W. B. Omohundro 1 W. T. Waggoner, 1,100 ft. from E and 150 ft. from S lines of Sec. 49, Blk. 4, H.&T.C. Sur., 6⅝-in. 1,229 ft., show oil 1,229-47 ft., rigging up spudder.

Wise County

Cranfill & Rogers 1 McKay, Sec. 8, Falls C.S.L. Sur., T.D. 7,154 ft., prep. test, show oil 6,940-80 ft., top Ellenburger 7,005 ft.
Manahan Oil 1 E. R. Collier, J. M. Wade Sur., Abst. 868, contract depth 7,500 ft., prep. drill ahead below 6,047 ft.

Young County

E. Lennington 1 Perry, 165 ft. N of C of river and 46 ft. from W line of 126-acre A. W. Perry farm in Oliver T. Brown Sur., Abst. 25, S.D. 165 ft.
Ben H. Rankin 1 Mary Logan, SW part Blk. 2, J. W. Doty Sur., 8 mi. NE Graham, 2 mi. W Nelson field, small showing oil 3,575-3,600 ft., 5½-in. 3,565 ft., drilled plug and bailed dry, S.D. 3,613 ft.
B. C. Gilmore 1 Bagley, 210 ft. from E and 650 ft. from S lines of Leroy W. Ross Sur., Abst. 1352, 700-ft. test, location.
L. T. Burns 1 Bloodworth, 150 ft. from N and 783 ft. from W lines of Sec. 214, T.E.&L. Sur., 1,000-ft. test, location.
S. D. Glover 1 C. E. Luton, 150 ft. from S and E lines of J. L. Elmore Sur., Abst. 1421, drilling 712 ft.
Dorian & Farrell 1 Grigsby, Sec. 416, T.E.&L. Sur., show oil 3,974-79 ft., casing set 3,974 ft., moving in spudder to test.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Jan. 20.—Completion of Jones County's new Swastika sand discovery in the Noodle Creek area, together with new wildcats for several counties, marked a busy week in the West Central Texas district.

The discovery is Humble Oil & Refining Co. 2 J. C. Sears estate, SW SW SW Section 37, Block 18, T.&P. Survey, just east of the Noodle Creek field and just south of the second Swastika field opened in the area 2 years ago. The well established a daily potential of 1,182 bbl., based on an official gage of 702 bbl. in 14 hours and 45 minutes. Flow was natural from sand from 3,010-22 ft., through ¾-in. tubing choke. The rig is being skidded one location west for a direct offset which will be 1-B D. O. Huddleston, 467 ft. from the south and east line of Section 38, same block and survey.

The McCaulley discovery area in Fisher County is undergoing immediate development as one test drills ahead below 2,000 ft. and another is preparing to start. It was opened to production from the Swastika sand at the close of the past year by the F. A. Stephenson 1 Maberry. The active operation is the discovery operator's 1 J. P. Humphries, a 1½-mile southwest outpost and located in the NW cor. Section 49, Block 1, H.T.&B. Survey. New location for the area is P. R. Long 1 W. F. Davidson, a mile west of the McCaulley townsite. It is contracted to 5,000 ft., however, will primarily seek production from the 3,300-ft. Swastika level opened by the discovery well. Location is SE NW Section 59, Block 1, H.T.&B. Survey.

Jones County

The north extension area of the Avoca field, sometimes called the Olson field, is undergoing renewed development as one new well is being completed and another is planning to start. The finaled well is King Oil 2 C. H. Seth, which has been shut in ungaged since before Christmas. It completed an official gage flowing 327 bbl. of oil in 23 hours, naturally, from the Palo Pinto lime from 3,234-41 ft. Located 990 ft. from the SE cor. of SW¼ Section 191, B.B.B.&C. Survey, it is just north of a previous failure which is being reworked for deepening. Ungren & Frazier and J. F. West were rigging up to deepen 1 Carlton, a west offset to King Oil 1 Olson which was the field's discovery well. The failure is bottomed at 3,246 ft. and will be carried to 3,300 ft. in search of new saturation.

WEST CENTRAL TEXAS COMPLETIONS

(24-hour gages)

Coleman County

Santa Anna gas field: Lone Star Gas 1 Gay, top Marble Falls 2,210 ft., 4,150,000 cu. ft. gas, 2,000 gal. acid, 2,238-47 ft.

Jones County

Wildcat: G. M. Gillespie 1 King, NW Sec. 53, O.A.L. Sur., dry at 2,615 ft.
Lewis field: Sandy Ridge Oil 2 Brock, 120 bbl., pumping, 4,500 gal. acid, 1,890-1,900 ft.
Sayles field: Johnson and Ungren & Frazier 3 Sayles, Jr., 156 bbl., flowing through open tubing, 1,930-51 ft.
Semiwildcat: C. W. & W. L. Snoddy 1 Akins, Subd. 2, Sec. 9, Blk. 16, T.&P. Survey, dry at 2,587 ft.

Shackelford County

Semiwildcat: P. S. Kendrick 2 Mathews, SE¼ Sec. 20, B.A.L. Sur., dry at 749 ft.
Davis field: Rhodes & Higher 18 Davis, 35 bbl., pumping, 1,194-1,209 ft.

Taylor County

View field: Tal-Vez Oil 1 Smith, dry, H.F.W., 3,077 ft., T.D.

WEST CENTRAL TEXAS WILDCAT REPORT

Brown County

A. J. Stokes 1 B. S. Bayston, 210 ft. from SE line and 2,962 ft. from SW line of Prosper Mangel Sur. 604, top Marble Falls 1,487 ft., set 5¾-in. casing.

Callahan County

Rhodes Drilling Co. 1 N. M. George, NW Sec. 75, O.A.L. Sur., 4 mi. E Baird, 2,700-ft. test, T.D. 2,641 ft., P.B. 2,150 ft., S.D.O. after shot.
W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines, Sec. 2, C.&M. Sur., S.D., casing 815 ft.
C. D. Hagerty 1 Windham, 990 ft. from N and 330 ft. from W lines, SE Sec. 154, G.H.&H., Sur., show oil 980-85 ft., S.D., but may deepen.
Reeves & Sorrell 1 Young, 1,980 ft. from N and 660 ft. from E lines, Sec. 37, B.B.B.&C. Sur., H.F.W. 1,975-2,000 ft., 6⅝-in. 2,000 ft., W.O.C.

Coleman County

A. P. Heinze, 1 J. Kincaid, 467 ft. from N and W lines of E½ SW Sec. 41, B.B.B.&C. Sur., 3,800-ft. test, drilling 3,090 ft.
L. J. Derrick 1 J. W. Vance, 330 ft., NW of old Texas 1 Vance, also in Sec. 101, E.R. Sur., 2,100-ft. test, location.
R. H. Murray 1 Morris, 467 ft. S and W of NE 160 ac. of J. Greenwood Sur. 304, drilling 1,410 ft.
M. R. Stuard 1 Minear, 330 ft., from N and 1,850 ft. from E lines of 360-ac. tract in E. Votaw Sur. 244, location.
Cooper Brothers 1 McClure, 1,100 ft. from S and 2,400 ft. from W lines of T. B. Frizzell Sur. 711, 2,800-ft., location.

Comanche County

Campbell 1 Stark, SW part of Asa Hoxey Sur., S.D. repair 145 ft., will set 6⅝-in.
Natural Resources 1 Armor, Sec. 105, T.&N.O. Sur., 5 mi. NE of Eden, cleaned out to old T.D., prepare resume drilling, no report.

Concho County

Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur.,
(Continued on Page 82)

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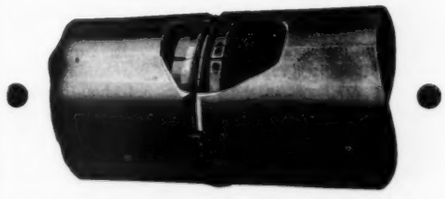

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New and Deeper Sand Found In Gueydan, Vermilion Parish

By F. L. SINGLETON

NEW ORLEANS, La., Jan. 20.—The opening of important oil production from a new and deeper sand on the south flank of the Gueydan field, Vermilion Parish, highlighted developments in the Louisiana Gulf Coast district the past week. The discovery was made by Fohs Oil Co. 2 Mulvey Irrigation Co. which flowed at the estimated rate of 400 bbl. of 35-gravity oil per day through a 12/64-in. choke while cleaning out from perforated casing at 9,722-42 ft. The well is located in 34-11s-1w, about 600 ft. southeast of the company's 1 Mulvey Irrigation Co., which was completed in November 1940 as a gas-distillate producer from sand at 9,248-54 ft. However, this well is now reported to be flowing at the rate of 210 bbl. of 34.5-gravity oil.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	8	1,896	58,263
Dry holes: Fields:	3	.....	18,702
Wildcats	1	.....	10,804
Total	12	.....	87,769

Gueydan was discovered in 1929 and until the completion of the above well, has never been regarded as an important reserve. Production heretofore has been confined to shallow sands on top of the structure and at a recent date only 6 of approximately 20 wells drilled were listed as producing wells.

Humble Oil & Refining Co. has apparently reestablished flank production at the Bayou des Glaize dome, Iberville Parish as the company's 3-B Wilberts flowed at the rate of 10 bbl. of 38.2-gravity oil while testing through perforated casing at 7,186-90 ft. However, at the close of the week the well is reported to have sanded up, and the company was retesting. The well is located on the north flank of the structure a short distance from 2-B Wilberts, which flowed for several days from sand at 8,658-57 ft. This well was later abandoned due to salt water encroachment.

Lakeside Test

Although still in the testing stage, Lisbon-Iberia Oil Co. have apparently opened distillate production in the Lakeside area, northwest of the Grand Lake field, Cameron Parish, as 1 Calcasieu National Bank, tested 2,300 lb. working pressure and recovered 35 ft. of distillate, seven stands and two joints of slightly brackish water on a 23-minute drill-stem test at 10,050-60 ft. This well was drilled to a total depth of 10,215 ft., and 6-in. casing was cemented on bottom, preparatory to testing several sand sections logged by an electrical survey at intervals from 6,192-9,557 ft. Superior Oil Co. of California is reported to have purchased approximately 1,700 acres in the area from Lisbon-Iberia Oil Co. for a cash consideration of $50,000. The acreage is located in Sections 8, 17, 18, 20 and 30 in 12s-3w, and Sections 24 and 25 in 12s-4w.

The LaPice field, St. James Parish, originally opened as a gas-distillate field and which received its first oil production in 1940, received its second crude oil producer with the completion of Shell 1 Schexnayder-Community which is flowing at the daily rate of 360 bbl. of 39.3-gravity oil daily through a 14/64-in. choke from perforated casing at 7,664-75 ft. The well is located in 38-21s-15e about midway between gas-distillate production and 1 Federal Land Bank about ¼ mile northwest which opened crude production from approximately the same sand section.

The Kenilworth field, St. Bernard Parish which has been inactive for several months received a new operation as Vendome staked location for 4 Kenilworth Plantation, about 2,000 ft. northeast of the discovery well. Two dry holes have been drilled since the discovery both of which were located to the north and southwest.

Interest in the Anse La Butte field, St. Martin Parish is centered on a deep flank test being drilled by W. R. Davis on the Voorhies tract in 72-9s-5e. While the well continues to drill below 9,100 ft., a string of 7-in. casing is reported to have been moved to the location. The well is being drilled tight and no showings of oil or gas have been reported.

Lisbon-Iberia Oil Co. 1 Edgewood Land & Logging Co., located southwest of the Perkins gas-distillate field, Calcasieu Parish is drilling in shale below 4,500 ft., and is reported to be checking favorably with the discovery well which was drilled by Humble Oil & Refining Co.

Gulf 1 Louisiana Progress Co., a deep test located on the flank of the Edgerly field has plugged back to 5,936 ft., and is preparing to sidetrack. This well showed indications of opening a new sand for this old structure when it attempted to blow out from sand at 7,500 ft. However, the drill-stem became stuck and no test was attempted.

In the South Roanoke field, Jefferson Davis Parish, Continental Oil Co. continues to drill below 10,680 ft. in 1 Jaenke located on the extreme north side of the field. Although no shows have been reported, casing was recently cemented below 9,600 ft.

McDannald Oil Co. 3 Futral located on the north flank of the Port Barre field, St. Landry Parish has been recompleted for an initial production of 275 bbl. per day through a ¼-in. choke. The well is flowing from sand at approximately 5,650 ft., which is believed to be from a new producing horizon on this side of the field.

In the shallow Ritchie field, Acadia Parish, Vincent and Welch 1 Hayes, is reported to be flowing wash water and oil, while testing in the discovery sand at 3,503-14 ft. The well is located south of Bering Oil Co. 1 McManus, and the completion extends the field about 400 ft. south.

LOUISIANA GULF COAST COMPLETIONS

Assumption Parish

Wildcat: Shell 1 State-Grassy Lake, dry, T.D. 10,804 ft.

Avoyelles Parish

Eola field: Crosby Drilling Co. 1 Whitlow, 6-2s-3e, 340 bbl., 3/16-in. choke, perf. casing 8,430-90 ft., T.D. 8,530 ft.

Cameron Parish

Chalkley field: Shell 8 Hanszen, 27-12s-6w, 421 bbl., 7/64-in. choke, perf. casing 10,080-92 ft., T.D. 10,172 ft.

East Baton Rouge Parish

University field: Lisbon-Iberia Oil Co., 66-7s-1w, 5 Duplantier, 200 bbl., ⅛-in. choke, perf. casing 6,770-76 ft., T.D. 6,800 ft.

Evangeline Parish

Ville Platte field: Continental 1 Ortego-Guillery, 26-3s-2e, 200 bbl., 3/16-in. choke, perf. casing 9,030-45 ft., T.D. 10,230 ft.

Jefferson Parish

Barataria field: California Co. 4 Fleming Plantation, 15-5s-23e, 324 bbl., 10/64-in. choke, sand 8,760-85 ft., T.D. 8,785 ft.

La Fourche Parish

Golden Meadows field: Bateman Drilling Co., 12-19s-22e, 1 B. J. Collins, 180 bbl., ⅛-in. choke, perf. casing 5,436-40 ft., T.D. 5,520 ft.
Brown & Wood 7 State, 12-19s-22e, 74 bbl., 10/64-in. choke, perf. casing 2,650-75 ft., T.D. 2,676 ft.
Superfine Oil Co. 1 A. Martin, 12-19s-22e, 157 bbl., 10/64-in. choke, sand 5,440-50 ft.

St. Mary Parish

Bateman Lake field: Texas 1 Atchafalaya, dry, T.D. 11,262 ft.
Charenton field: Pan American 9 South Coast Corp., dry, T.D. 3,068 ft.

St. Martin Parish

Bayou Bouillon field: Superior 5 Rycade, dry, T.D. 4,372 ft.

LOUISIANA GULF COAST DRILLING REPORT

Acadia Parish

Humble 3 Leger, South Crowley field, 22-10s-1e, drilling shale 8,503 ft.

Calcasieu Parish

Gulf 1 Calcasieu National Bank, Hayes prospect, 18-11s-5w, 13⅜-in. casing 1,830 ft.

Iberia Parish

Gulf 1 Petit Anse Co., Avery Island salt dome, 59-13s-6e, drilling shale 3,860 ft.

Jefferson Parish

Titanic Oil Co. 1 Marrero Land & Investment Co., Westwego prospect, 2-13s-23e, drilling 9,916 ft.
Reese B. Carter 1 Cravens, Westwego prospect, 3-13s-23e, rigging up.

Jefferson Davis Parish

Continental 1 Jaenke, South Roanoke field, 24-10s-4w, drilling shale 10,615 ft.

St. Bernard Parish

California Co. & Tidewater 1 Biloxi Marsh Lands Co.,
(Continued on Page 84)

West Central Texas Fields

(Continued from Page 81)

10 mi. SW Eden, show oil and gas 3,792-95 ft., 3,819-20 ft., at 3,828-29 ft., showed 1 bailer water per hr., may drill deeper.

Eastland County

C. D. Lane 1 Mason, 900 ft. from N and 750 ft. from W lines of W½ NE Sec. 13, D.&D.A. Sur., drilling 965 ft.
W. M. Morris 1 Carrie Bryant, 1,520 ft. from N and 200 ft. from W lines of SE Sec. 20, Blk. 1, H.&T.C. Sur., 6⅝-in. 825 ft., show gas 912-925 ft., S.D.
Hickok Oil 1 Luse & Gray, NE Sec. 486, S.P. Sur., Ordovician test, ¾ mi. SE of new McElreath field, 4,250-ft. test, drilling 1,380 ft.

Erath County

W. A. Young 1 J. B. Mills, J. Harvey Sur., 5 mi. NW of Dublin, T.D. 212 ft., cleaning out hole.

Fisher County

F. A. Stephenson 1 Maberry, SE SW Sec. 56, Blk. 1, H.T.&B. Sur., 3,400-ft. test, cored 3,285-3,302 ft., recovered sand showing oil, opened to flow 57 bbl. oil in 1 hr., later swabbed 93 bbl. oil in 10 hr., top Swastika 3,277 ft., 40-gravity oil, deepened to 3,315 ft., still testing with slight oil increase.
General Crude Oil 12 Flanigan, center of old Royston field, Ordovician test, drilling 5,792 ft.
F. A. Stephenson 1 Humphries, NW NW Sec. 49, Blk. 1, H.T.&B. Sur., 3,350-ft. test, location.

Hamilton County

A. J. Caldwell 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines, W. H. Crowder Sur., drilling past bit 3,002 ft.
C. J. Meyers 1 Oats, 420 ft. from S and 1,035 ft. from E lines, F. Hughes Sur., 4,000-ft. test, top Mississippian lime 3,827 ft., top Ellenburger 3,839 ft., flowing water into pits, no oil, still testing.
Falls Ref. Co. (formerly Wallace & Vickers) 2 Lund, C S½ of 20 acres of N½ of SW¼, R. J. Bailey Sur. 51, T.D. 3,953 ft., prep. P.B. to shut off 9 bbl. sulfur water per hour from 3,863-3,953 ft.
Gunther & Smith 1 Thompson, 467 ft. from SE and 4,533 ft. from SW lines of Rhody Kennedy Sur., spudded and S.D.
Hensley & Watson 1 Manning, 467 ft. from W and 2,500 ft. from S lines of Agapo Gaithan Sur., rotary on location.
Bob Waters 1 Oates, 3,350 ft. from SE and 8,450 ft. from NE lines of F. Hughes Sur., S.D. 350 ft., may change operators.

Jones County

Humble 2 Sears, 467 ft. from S and W lines of Sec. 37, Blk. 18, T.&P. Sur., top saturation in Swastika 3,010 ft., saturation from 3,010-22 ft., flowed 702 bbl. in 14 hrs. or rate of 1,182 B.O.P.D.
Shaheen Oil 1 Young, 11,630 ft. from N and 300 ft. from E lines, S. Andrews Sur. 191, 2,500-ft. test, location.
Danciger O. & R. 1 H. E. Gale, NE NE Subd. 91, De Witt C.S.L. Sur. 2,500-ft. test, location.
H. Hines & W. D. Brookover 1 A. N. Wimberly, SW SW Subd. 91, De Witt C.S.L. Sur., 2,500-ft. test, prep. spud.
Fain-McGaha Oil 1 Moore, 660 ft. from NE and 1,320 ft. from SE of S 107 acres of J. D. Maltby Sur. 252, 2,500-ft. test, spudding.

McCulloch County

W. J. Dillard 1 E. B. Garrett, 467 ft. from N and E lines of Sur. 934, Abst. 1196, 3,000-ft. test, location.
A. K. McCord 1 J. E. Nelson, 150 ft. from W and 1,546 ft. from S lines, Sec. 959, E. Gruene Sur., Abst. 957, location.

Menard County

Harry Baldwin 1 Leggett, SW SW Sec. 1, B.S.&F. Sur., S.D. casing 1,040 ft.

Palo Pinto County

Cole & Davis 1 Rogers, 467 ft. from S and E lines, Sec. 894, T.E.&L. Sur., T.D. 1,002 ft., running 8¾-in. casing.
Georgian Oil 1 Weldon, A. J. Smith Sur., Abst. 383, S.D. 1,425 ft.
E. Guyer 1 Dalton, L. B. Dalton Sur., Abst. 153, show gas 3,827-53 ft., show oil and gas 3,879-81 ft., bailing live oil, some water coming in behind 8¼-in. casing at 1,930 ft., T.D. 3,881 ft. (corrected).
Elgin & Watson 1 Watson, NE NW Sec. 10, Blk. 2, T.&P. Sur., fishing 4,065 ft.
Hickok Prod. and Reynolds 1 J. R. Halsell, 467 ft. from S and W lines, Sec. 92, B.B.B.&C. Sur., Abst. 105, 5,500-ft. test, location.

Shackelford County

Georgian Oil Corp. 2 Blach, 1,290 ft. from SE and 540 ft. from SW lines, Sec. 301, T.E.&L. Sur., deep test, spudded and S.D.
Choate 1 Green, 150 ft. from N and W lines of N½ SE Sec. 61, Blk. 12, T.&P. Sur., drilling 996 ft., last report.
R. T. Nail 1 Cook, 150 ft. from N and W lines of SE SW Sec. 53, E.T. Sur., S.D. 300 ft.

Runnels County

A. J. Johnson 1 Bert Fletcher, E. W. Bull Sur. 333, 5,500-ft. test, S.D. 515 ft.

Taylor County

Ce-Beth Oil 1 City of Abilene, south shore of Lake Abilene on city property, 4,000-ft. test running 10-in. casing 2,300 ft.

Spirited Lease Play Spreads Through Entire District

By R. MARNE SANFORD

DALLAS, Tex., Jan. 20.—In spite of the fact that the first failure for the rapidly developing Hawkins field in Wood County was registered the past week, a vast and widespread lease play is spreading to virtually all counties in the Eastern Texas district, all touched off by the discovery of oil at Hawkins several weeks ago. Hundreds of thousands of dollars have been spent in the past few weeks throughout the district and that amount is expected to be greatly increased before the play levels off into actual drilling.

The heretofore unchecked spot where the boom started was given a setback, however a seemingly insignificant one, when a northeast outpost was quit as dry the past week. The failure was E. C. Johnson 1 J. M. Green, in the John P. Mosely Survey, 3 miles northeast of the Hawkins townsite discovery and an equal distance east and slightly south of the original discovery, Manziel 1 Morrison. Correlated low, structurally, the failure definitely checks the development in a northeasterly direction. At what point between the townsite discovery and the failure 3 miles to the north the structure definitely drops off will have to be determined by future drilling. The well ran about 60 ft. lower than the Manziel 1 Morrison, lowest producer yet completed in the area. No. 1 Green was quit at a total depth of 4,835 ft. after topping the Woodbine at 4,575 ft.

Meanwhile another townsite test was put on the producing list when Hollandsworth Drilling Co. 1 Robbin, in Lots 16 and 17 of the Reese addition of the town, made 185 bbl. of oil in 6 hours through 1/4-in. choke under pressures of 700 lb. on tubing, 625 lb. on casing.

SUMMARY OF COMPLETIONS

East Texas Field

	No.	Bbl.	Footage
Oil wells: Gregg County	8	281	28,635
Rusk County	3	70	10,986
Upshur County	2	126	7,323
Total	13	.....	46,944

East Central Texas

Oil wells	2	793	9,662
Dry holes: Wildcats	3	.....	11,245
Plugged gas well: Hawkins	1	.....	4,363
Total	6	.....	25,270

Completion was through three sections of casing perforations from 4,686-4,727 ft., 4,730-35 ft., and 4,749-64 ft. The initial production may be placed above that of the original Rotondi well which made 120 bbl. hourly through 1-in. choke.

Meanwhile work is progressing toward launching a full-scale development program for the area by Humble Oil & Refining Co. It is spudding its first two tests for the area, one an offset to the Manziel 1 Morrison, and the other a mile south and slightly east of the Manziel well. Offsetting 1 Morrison to the east is Humble 1 A. T. Clift, 467 ft. from the west line of a 106-acre tract in the James Pollack Survey. In the southeast corner of the same survey and in the E. W. Moore land, Humble is starting its second test. It is located 467 ft. out of the northwest corner of the tract.

Construction work is nearing completion on the company's camp being built to house workmen in the development of the field. Also Humble has let contract for the construction of a 6-mile pipe line south from the field to connect with its Van-Longview carrier. It will be a 6-in. line.

In Smith County, the Sells Petroleum Co. has staked tentative location for a wildcat test on one of two tracts in the N. Wren Survey. It will be either on the 50-acre C. J. Kay tract or on the 122-acre C. J. Kay tract, about 2 miles northwest of Winona and 5 miles south of the Hawkins discovery in Wood County. The company has a 3,600-acre block in the area.

In Upshur County Sun Oil Co. has staked location for a deep 7,000-ft. exploratory hole on the Ore City structure just outside of the town by that name. It is to be 1 W. C. Henderson, 660 ft. from the northwest and 800 ft. from the northeast lines of a 27-acre tract out of a 120-acre tract in the Robertson Asher Survey. Sun Oil Co. holds a large block in the area together with several smaller holdings by Gulf, Shell, Magnolia, and several independents. The location is on a lease due to expire in February of this year.

EAST TEXAS FIELD COMPLETIONS

Gregg County

Longview area: Atlantic Ref. 1 Jones, 54 bbl. in 1 hr., open tubing, 3,568-3,642 ft.
D. Godfrey 2-A T. B. Harris, 5 bbl. an hour, pumping, 3,496-3,514 ft.
Hamil & Smith 2 Beahman, 30 bbl. an hour, 3,483-3,515 ft.
Stanolind 66-B McKinley, 30 bbl. in 8 hr., open tubing, 3,573-89 ft.
Texas 5 Phillips, salt-water-injection well at 3,823 ft.
H. Vaughn 11 G. Jones, 30 bbl. in 30 min., 3,544-3,673 ft.
Kilgore area: Henry Oil 13 Laird, 52 bbl. in 1 hr., open tubing, 3,548-66 ft.
Overton Ref. 23-B I.&G.N.R.R., 150 bbl. in 5 hr., 3,549-73 ft.
Ed Pace 10 Trip Elder, 20 bbl. an hour, 3,546-63 ft.

Rusk County

Kilgore area: Constantine Oil & Gas 10 Mayfield, 40 bbl. in 1 hr., 3,610-40 ft.
Joiner area: Aston-Greenway 15 Alford, 15 bbl. in 1 hr., 3,565-3,603 ft.
Shell 29-B H. Brooks, 32 bbl. in 2 hr., 3,650-3,743 ft.

Smith County

Texas 20 Blackwell, salt-water-injection well at 3,855 ft.

Upshur County

Longview area: R. Lacey 23 Victory, 43 bbl. in 30 min., 3,667-69 ft.
R. M. Wood 1 R. M. Wood, 20 bbl. in 30 min., 3,653-54 ft.

EASTERN TEXAS WILDCAT REPORT

Anderson County

R. H. & W. Oil 1 Saunders, 17-acre tract in Joseph Ferguson Sur., in Frankston townsite, 5,000-ft. test, 7-in. 4,960 ft., W.O.C.
Texas 1 Greenwood, M. Salisar Sur., 4 mi. NW Palestine, 10-in. 1,046 ft., 1,623 ft.

Fannin County

Damon Oil 1 A. L. Chaffin, SW cor. 85-acre tract, J. Ketcham Sur., 4 mi. NE Bonham, location cleared, prepare move in materials.

Freestone County

C. W. Killough and E. B. Germany 1 Woolens, J. Ryan Sur., 9 mi. N Fairfield, S.D. for orders 1,897 ft.

Hill County

Rush & Sanders 1 Hutchinson, L. W. Williams Sur., 2 mi. SW of Mt. Calm, S.D. 570 ft.

Kaufman County

T. G. Shaw, trustee, 1 Agnes Wynne, B. S. Newman Sur., 8 mi. E of Kaufman, lower Trinity test, S.D. for high water 6,454 ft.

Lamar County

T. M. Parmly 1 C. H. Townsend, J. S. Porter Sur., 1½ mi. N of Chicolo, S.D. 1,612 ft.

McLennan County

E. P. Campbell 1 Stewart, S. Burton Sur., 5 mi. N of Waco, S.D. 712 ft.

Limestone County

Farrell Drlg. and Gulf Oil 1 F. Bevill, J. H. Murray Sur., 1 mi. SW of Horn, Travis Peak 4,892 ft., drilling 5,121 ft.
Hardin & Ames 1 Hammond, J. Folk Sur., 1½ mi. NW of Kosse, Glen Rose 4,290 ft., perf. casing in gas zone 5,805-10 ft. and 5,776-92 ft., bailed acid water and show oil, S.D. 5,955 ft.

Navarro County

Hargrave Oil 1 C. S. West, M. Boren Sur., 1½ mi. S Richland, T.D. 3,257 ft., salt water.

Raines County

Plains Prod. 1 W. D. Foster, T. Cummings Sur., 1 mi. NW Alba, top Austin chalk 3,855 ft., drilling 4,028 ft.

Red River County

J. F. Morrissey 1 Tyler, James Miro Sur., 3½ mi. SE of Bogota, 5,000-ft. test, S.D. 2,910 ft., top sub-Clarksville 1,595 ft., Woodbine 1,960 ft.

Rusk County

Shell 1 Markey, A. Nolen Sur., 4 mi. SW Mt. Enterprise, location.

Smith County

O. L. Ross 1 Dr. Willingham, J. Herrin Sur., 2 mi. E Whitehouse, 10-in. at 110 ft., prepare to drill ahead.

Trinity County

R. W. Burnett 1 Southern Pine Lumber Co., G. Ricardo Sur., 2 mi. N Apple Springs, moving in material.

Wood County

Delta Drlg. Co. and Sells Pet. 1 Beckham, G. W. Cowan Sur., 4½ mi. NE of Mineola, S.D. 1,448 ft., prep. to drill deeper.
Hollandsworth Drilling Co. 1 Robbin, George Brewer Sur., Lots 16 and 17, in Hawkins townsite, Reese Addition, Woodbine 4,398 ft., gas sand 4,469 ft., oil sand 4,568 ft., T.D. 4,803 ft., flowed 185 bbl. in 6 hr.
Hollandsworth and C. W. Johnson 1 Lynch, Lots 18 and 19 in Hawkins townsite, 200 ft. W of 1 Robbin, building derrick.
Hollandsworth 1 Bryan, C. M. Patton Sur., 1½ mi. W Hawkins, 467 ft. from N and E lines of survey, location.
W. L. Goldston 1 Osborne, H. S. Cobb Sur., 1 mi. SE Hawkins, 330 ft. from N and E lines of survey, 10¾-in. 1,203 ft., prepare drill ahead.
Roger Lacey 1 Beck, Brewer Sur., in Hawkins townsite, E offset to Rotondi discovery well, moving in material.

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

Long Lake field: J. K. Hughes 2 J. H. Reagan, 121 bbl., ⅛-in. choke, 5,354-80 ft.

Angelina County

Wildcat: K. L. McHenry 1 W. Cameron Lumber Co., W. B. Anderson Sur., 7 mi. SE Zavalla, dry at 3,514 ft.

Franklin County

Talco field: Talco Asphalt & Ref. 6 Rutherford, 112 bbl. in 4 hr., 4,250-82 ft.

Hopkins County

Wildcat: W. P. Vaughn 1 Mary Chapman, F. Hopkins Sur., 1 mi. N Tira, dry at 5,938 ft.

Trinity County

Wildcat: R. W. Burnett 1 Trinity Lumber Co., J. Hanley Sur., 1 mi. W Groveton, dry at 1,793 ft.

Wood County

Wildcat in Hawkins area: W. J. Johnson 1 F. M. Green, J. P. Moseley Sur., 2½ mi. NE Hawkins, top Woodbine 4,575 ft., dry at 4,835 ft.
Bobby Manziel 1 Lee Bell, E. Wideman Sur., top Pecan Gap 3,030 ft., Austin chalk 4,214 ft., junked and abandoned at 4,363 ft. after 20,000,000 cu. ft. of gas was killed with 1,886 sacks cement.

Oklahoma Fields

(Continued from Page 75)

Cored 4,425-43 ft. and 4,443-62 ft., D.S. test, drilling 4,585 ft.
Portable Drilling 1 Adams ..... SW NW NW 3-14-4e
Drilling 4,130 ft.

Logan County

Hamilton & Fain 1 Donoghue ..... NW SE 7-17-1w
10-in. 125 ft., drilling 700 ft.

Muskogee County

Storm Feltz 1 Moore ..... NW SE SE 4-14-17e
Viola 2,382 ft., drilling 2,400 ft.

Noble County

Elson & Hudson 1-A Conway .... NE NE NE 16-23n-2w
Deer Creek 2,150 ft., cored 3,575-90 ft., full recovery, 1½ ft. fine porous sand with show gas and oil, 13½ ft. medium tight sand stained.

Okfuskee County

Burke-Greis 1 Mullins ..... SW SE SE 5-10-10e
15-in. 37 ft., 12-in. 470 ft., drilling 830 ft.
O. C. Moffet et al 1 D. W. Johnston SE NE NE 22-10-11e
Machine.
J. O. Hayes 1 McKernan ..... E½ SE NW 25-12-8e
T.D. 4,070 ft., running casing.
Henry Oil 1 Dudgeon ..... NE SW SE 36-12-9e
Flowed 380 bbl. in 3 hr., still testing.
Shell 1 Davis ..... SW SW SW 18-13n-9e
P.B. to 4,001 ft., to perf. Hunton 3,956-66 ft.
W. O. Carte 1 Bucco ..... NE NE SE 20-10-12e
Booch 1,882 ft., show oil, drilling 1,999 ft.
Deep Rock 1 Davis ..... SW SE NE 20-11-9e
T.D. 4,192 ft., filled 1,300 ft. salt water in 2 hr., P.B. 3,986 ft., perf. 3,916-60 ft., gaged 6,000,000 cu. ft. gas, R.P. 1,480 lb., acid, gaged 58,284,000 cu. ft. gas, S.I. pipe line.

Pottawatomie County

Kerlyn Oil 1 Cherry ..... SE NE NW 32-8-5e
Spotted oil show 4,312-20 ft., saturated dolomite 4,320-25 ft., swabbed 110 bbl. in 10 hr., gravity 40.7, lost swabber, fishing.
Guisso & Eason 1 Raystr ..... SW NW NW 33-6-3e
Rig.

Seminole County

Weldon Hall 1-A Jackson ..... N½ NE SE 14-7-7e
Booch 3,168 ft., slight stain and good odor 3,168-75 ft., preparing to core.
Delaney and Atlantic 1 Clark ..... NE NE SE 30-8-7e
Cored 4,266-71 ft. and 4,271-76 ft., show gas, made 1,000,000 cu. ft. gas on D.S. test through ½-in. choke, D.S. test 4,283-89 ft. open 40 min. recovered 200 ft. oil and 75 ft. oily mud, 41.5 gravity, 7-in. casing.
Alma Oil 1 Borden ..... NE SE NW 4-8n-8e
T.D. 4,326 ft., swabbed oil and water, stayed 2,500 ft. in hole, set plug 3,200 ft., bailed 30 bbl. water per hour, P.B. 3,110 ft., to cement and test Gilcrease.

Stephens County

Halliburton 1 fee ..... SE SW SW 5-1s-7w
Sand, show oil 800-06 ft., broken sand 905-47 ft., T.D. 960 ft., running 6-in. casing.

Woods County

Gulf 1 Hess ..... NE NW 33-23n-13w
Having difficulty coming out of hole at 8,167 ft. in dense limestone and dolomite.

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MICHIGAN OPERATIONS

Prices Up Again as Production Continues to Decline

By OTTO C. PRESSPRICH

SAGINAW, Mich., Jan. 20.—Increasing production in the Adams field of Arenac County, which has risen to sixth place in productivity among Michigan oil fields, plus a pronounced upturn in Van Buren County output partly offset continued declines in the Freeman-Redding, Walker-Wyoming-Tallmadge and Allegan County pools during December to bring the state's yield of crude last month to 1,278,564 bbl., about 5,000 bbl. more than in November. The gain was due, however, to December's 31 days as the December daily average—41,244 bbl.—was 1,200 bbl. less than in November.

Michigan's 1940 production was approximately 19,750,000 bbl., about 4,500,000 bbl. less than 1939. Principal factor in the decline has been the rapid depreciation of the Kent-Ottawa area where production now is less than a fourth of what it was a year ago.

Last week's record of 14 completions included seven producer wells for combined initial potential of 845 bbl. a day, one natural-gas well and six dry holes. In the list is the first well of a wildcat nature for the year, the Welsh Oil Co. 1 Cussen in Blue Lake Township, Muskegon County. However, it was good for only 5 bbl. a day, after acid and nitro shots, being completed in Traverse at 1,840 ft.

Probably of more importance was the Daily Crude Oil Co. development of 3 Weatherby in Winfield Township, Montcalm County. First big well and the second commercial completion in the area, production was 500 bbl. a day, after acid treatment, and indications were that the result will be extensive development in the Howard City district. Production is from the Monroe at 3,355 ft. in a well two locations east of the discovery which originally was good for about 40 bbl. a day.

New production also was indicated for Bay County's Monitor Township as Chapman Oil Co. 1 Rechsteiner in Section 3, Monitor Township, filled with oil naturally. It is three quarters of a mile west of other production, a mile northwest of Gulf Refining Co. 1 Bateson deep test. Drilling was scheduled to be resumed this week in the deep test. L. C. McGregor 1 Kircher in Section 2, acidized a second time, was reported flowing better than 200 bbl. a day from Dundee, after having produced naturally on the pump at 10 bbl. The Chapman test, at 2,891 ft. was on pump test for a week before acid treatment. In Clare County a half dozen tests were nearing completion, interest centering in Winterfield Township development.

Seventeen drilling permits were issued in the past week by the state Conservation Department, six locations being listed for Allegan County, three for Ottawa, two for Arenac. Others are for tests in Genesee, Muskegon, Clare, Isabella, Kalkaska and Kent counties.

On January 16 buyers of southwestern Michigan crude produced in Allegan, Van Buren, Kent and Ottawa counties, increased paying prices 5 cents a bbl., to $1.23. The increase affects about 14,000 bbl. daily production and follows a 10-cent advance for Central Michigan production which was posted January 2.

SUMMARY OF COMPLETIONS

	No.	Prod.	Footage
Oil wells: Allegan County	1	40	1,581
Gladwin County	1	20	3,864
Isabella County	1	260	3,759
Montcalm County	1	500	3,355
Muskegon County	1	5	1,840
Van Buren County	2	120	2,387
Gas wells: Mecosta County	1	*4¼	1,391
Dry holes: Barry County	1	.....	1,875
Gladwin County	1	.....	3,573
Gratiot County	1	.....	914
Kalkaska County	1	.....	1,628
Montcalm County	1	.....	1,133
Van Buren County	1	.....	1,189
Total	14	.....	28,294

*Million cu. ft.

MICHIGAN COMPLETIONS

Allegan County

Salem Township: Salem Gas & Oil Co. 1 Heasley, NE SW NW 15-4n-13w, 40 bbl., acid, T.D. 1,571 ft.

Barry County

Hope Township: K. A. Fox 1 Benedict, NE NE NW 34-2n-9w, dry, T.D. 1,875 ft.

Gladwin County

Beaverton Township: Sun Oil 1 Tope, NE SE NW 36-17n-2w, 20 bbl., acid, T.D. 3,864 ft.
Bentley Township: Stork Oil Co. 4 Connolly, S½ SW NE 35-17n-2e, dry, T.D. 3,578 ft.

Gratiot County

North Star Township: V. R. Wilson 1 Probst, NE SE SE 4-10n-2e, dry in Michigan stray, T.D. 914 ft.

Isabella County

Vernon Township: Nollem Oil & Gas Co. 6 Thayer, SE NW SE 22-16n-4w, 260 bbl., acid, T.D. 3,759 ft.

Kalkaska County

Rapid River Township: Monarch Development Co. 1 Iron Co., C SE 16-28n-7w, dry, T.D. 1,628 ft.

Mecosta County

Sheridan Township: Red-Man Oil Co. 1 Starks, SE NW SW 13-17n-7w, 4,250,000 cu. ft. natural gas, T.D. 1,391 ft.

Montcalm County

Pine Township: H. L. Gentry Engineering Co. 2 Whitaker, C NW 33-11n-8w, dry at 1,133 ft.
Winfield Township: Daily Crude Oil Co. 3 Weatherby, SW SE SE 20-12n-9w, 500 bbl., acid, T.D. 3,355 ft.

Van Buren County

Bloomingdale Township: Louis Rose 2 Smith, NE NW NW 15-1s-14w, 20 bbl., naturally, T.D. 1,270 ft.
Columbia Township: Westbrook Drilling & Producing Co. 1 DeMoss, NW SE NW 9-1s-15w, dry, T.D. 1,189 ft.
Lang & Lewis 1 Summy, NE NE NE Sec. 12, 100 bbl., acid, T.D. 1,198 ft.

Muskegon County

Blue Lake Township: Welsh Oil Co. 1 Cussen, SW SW NW 5-12n-16w, 5 bbl., acid and shot, T.D. 1,840 ft.

Louisiana Gulf Coast

(Continued from Page 82)

T.D. 8,574 ft., plugged back, sidetracked and drilling in new hole below 5,700 ft.

St. Martin Parish

Superior 1-B St. Martin Land Co., deep test north flank Sec. 28 dome, drilling shale 8,460 ft.

St. Mary Parish

Humble 1 Miami Corp., Cypremort prospect, 15-15s-6e, drilling sand and shale 1,128 ft.

West Baton Rouge Parish

Amerada 1 Wilberts Sons Lumber & Shingle Co., Port Allen prospect, rigging up.

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REGISTERED PROFESSIONAL ENGINEERS

Ripley County, West Virginia Well Finds Oriskany Thin

By STAFF CORRESPONDENT

PITTSBURGH, Pa., Jan. 20.—In Ripley district, Jackson County, West Virginia, United Carbon Co.'s wildcat on the B. B. Meadows farm is disappointing in its gas volume while drilling through the Oriskany sand. With a surface elevation of 948 ft., the Corniferous lime was topped at 5,081 ft.; the Oriskany at 5,180 ft. showing an unexpected thinning of the lime to only 99 ft. There was an ungaged show of gas at 5,183 ft. and at 5,188 ft., the volume was 164,000 cu. ft. a day which increased to only 190,000 cu. ft. and then at 5,206 ft., it gages only 134,000 cu. ft. a day. The sand appeared very good yet the gas was missing. It may yet be shot into a commercial well.

During the past week 29 operations were reported in the lower eastern fields of which 2 were dry, 17 gas wells, and 1 oil producer with a daily initial of 37 bbl.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Southwest Pennsylvania			
Gas wells	2	†0.1	6,235
West Virginia			
Oil wells	1	*27	2,236
Gas wells: Oriskany field	4	†28.6	20,172
Other fields	9	†2.4	21,761
Dry holes	3	.....	11,687
Total	17	.....	55,850

*Barrels. †Million cu. ft.

SOUTHWEST PENNSYLVANIA

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. topped the Onondaga at 6,741 ft. in 3 Piedmont Coal Co. and cased and cemented at 6,754 ft. This places that member at 4,361 ft. subsea or about 66 ft. lower on structure than 1 Indian Creek Coal Co. the nearest well. Here, this company is drilling 4 Piedmont at 815 ft. New Penn Development Co., William E. Snee et al have reached 5,100 ft. in 3 Summit Hotel (Heyn). In North Union Township, Wasson and Co. et al have drilled by the bailer lost in the Marcellus shale and reached 6,762 ft. in 2 J. H. Sorg.

In Beaver County, L. D. McMichael et al ran casing to 1,275 ft. in the wildcat on the Elmer Pflug farm on Big Knob in New Sewickley Township, and will continue an 8-in. hole down to the Oriskany.

Clarion County

Porter Township: Squirrel Hill Gas Co. 1 Charles Fagley, 85,000 cu. ft. gas, Speechley, T.D. 2,580 ft.

Westmoreland County

Washington Township: Peoples 1 John Weister, 38,000 cu. ft. gas, Speechley & Bradford sands, T.D. 3,655 ft.

WEST VIRGINIA

In Ravenswood district, Jackson County, Columbian Carbon Co.'s wildcat on the F. F. Starcher farm topped the Corniferous lime at 5,170 ft. and is drilling at 5,181 ft. This company's test on the F. L. Roliff farm is drilling at 3,680 ft. Boggess Drilling Co. is down 1,010 ft. in 1 Mary Smith.

In Poca district, Kanawha County, Columbian Carbon Co. is delayed drilling through the Clinton sand in 1 John Price with the tools stuck at 6,625 and fishing at 6,675 ft. The test on the Copenhaver heirs also drilling to the Clinton is fishing at 5,860 ft.

In Harrison County, Hope Natural Gas Co. has reached 9,787 ft. in the deep rotary test on the C. S. Gribble farm in Grant district.

Boone County

Peytona district: Columbian Carbon 14 Bull Creek Coal Land Co., dry, Oriskany sand 4,851-61 ft.; drilling 4,868 ft.

Braxton County

Birch district: Pittsburgh & W. Va., 7780 C. L. Hamric, 567,500 cu. ft. gas; Injun sand, T.D. 1,903 ft.

Calhoun County

Sherman district: Coleman & Hamilton 3 T. S. Cunningham, 27 bbl. (daily average 30 days), Big Injun 2,163-2,221 ft.; oil 2,190-2,221 ft.; T.D. 2,236 ft.

Lincoln County

Sheridan district: Sweetland Land & Mineral Co. 1 Lola Evans, 43,000 cu. ft. gas; Big lime 1,474-1,648 ft.; Injun 1,666-81 ft.; Berea 2,235-50 ft.; T.D. 2,264 ft.

Washington district: United Carbon 1 Lincoln Mineral Co., 800,000 cu. ft. gas; Big lime 1,521-1,705 ft., Injun 1,705-58 ft.; Berea 2,198-2,214 ft.; brown shale 3,385-3,860 ft.; gas 2,885, 3,055, 3,127, 3,670 and 3,725 ft.; T.D. 3,863 ft.

Putnam County

Curry district: Union Exploration & Development Gas Co. 2 G. L. Paul, 98,000 cu. ft. gas; Big lime 1,340-1,520 ft; Injun 1,540-75 ft.; Berea 2,078-2,102 ft.; gas in Berea; T.D. 2,120 ft.

Summit Gas Co. 1 C. C. Paul, drilled deeper; 150,000 cu. ft. gas; started deepening 1,542 ft.; Big Injun 1,542-1,612 ft.; Berea 2,055-78 ft.; T.D. 2,078 ft.

Ritchie County

Grant district: South Side Gas Co. 1 Myrtle Powell et al, 280,000 cu. ft. gas, Injun sand, through Squaw, T.D. 1,823 ft.

F. S. Deem 1 L. C. Stephens, drilled deeper, dry, through Squaw, T.D. 2,140 ft.

Upshur County

Buckhannan district: Pittsburgh & W. Va., 7,777 Kent Lorentz. Benson sand, 4,651-59 ft.; show gas only 4,652-54 ft.; T.D. 4,679 ft., will abandon.

Wayne County

Stonewall district: United Fuel 2,101 Millard Adkins, drilled deeper; started 1,452 ft.; 31,000 cu. ft gas; Berea 1,965-93 ft.; brown shale 2,023-2,112 ft; 2,523-2,630 ft.; 2,658-2,988 ft.; T.D. 2,996 ft.

Owens Libby Owens 23 Hoard Baldwin, 184,000 cu. ft. gas, Big Injun, T.D. 1,646 ft.

Union district: Southern W. Va., Gas Corp. 2 A. W. Preston, 240,000 cu. ft. gas; Big lime 1,260-1,420 ft.; Big Injun 1,450-1,545 ft.; Berea 2,068-75 ft.; brown shale 2,730-3,060 ft.; gas 2,737-2,930 ft.; T.D. 3,068 ft.

ORISKANY GAS FIELDS

Kanawha County

Poca district: United Fuel 4880 Allie Pruitt, 1,500,000 cu. ft. gas before shot. Corniferous lime 4,904 ft.; Oriskany 5,014 ft., T.D. 5,058 ft.

Union district: Godfrey L. Cabot, 3 L. M. Lafollette 67,000 cu. ft. gas, Corniferous lime 4,693 ft.; Oriskany 4,787 ft., T.D. 4,836 ft.

Jackson County

Ripley district: McIntosh & Grimm 1 D. E. Anderson, 10,000,000 cu. ft. gas; Corniferous lime 4,797-4,925 ft.; Oriskany 4,925 ft.; gas 4,925-37 ft.; T.D. 4,957 ft.

Washington district: R. E. McCabe 2 F. M. Ray, 16,995,000 cu. ft. gas; Corniferous lime 5,182-5,299 ft.; Oriskany 5,299-5,321 ft.; gas 5,303-21 ft.; T.D. 5,321 ft. This is one of the largest natural wells in the pool.

California Fields

(Continued from Page 73)

Inglewood Field

Standard 3-1 L.A.I. 17-2s-14w
T.D. 8,950 ft. Hard Miocene sandy shale. Formation test 8,805-8,900 ft., open 60 min., light blow. Recovered 227 ft. drilling mud showing trace of oil and gas. Los Angeles County.

R. R. Bush Oil Co. 1 Smith 8-2s-14w
Drilling 7,980 ft. in sandy shale showing increasing quantity of gas. Located northwest end of Inglewood structure. Los Angeles County.

LOS ANGELES BASIN WILDCATS

Dominguez-Gardena District

Hiles Drilling Co. 1 Grant 29-3s-13w
Drilled to 7,666 ft. by Pongratz Pet. Co. and abandoned in 1940. Preparing to clean out and deepen. Los Angeles County.

COASTAL DISTRICT

One of California's oldest oil fields is scheduled to be abandoned within the next 60 days as the state Division of Lands, unable to negotiate a tideland lease with the Submarine Oil Co. because the small production secured is insufficient to pay a royalty, has ordered removal of one of two piers in the Summerland field of Santa Barbara County. After the first pier has been removed the way will be cleared for demolition of the second pier. These piers which were erected back in 1896 are about 150 ft. in height at the present time and extend into the Pacific Ocean at right angles to the shore line. At one time there were about 10 piers extending out into the ocean and each contained about 10 wells which had been bottomed in the shallow oil zone. Development work in the Summerland field started at the base of Ortega Hill and within a short time wells were completed along the beach and finally out in the ocean itself. High tides at frequent intervals during the life of the field have demolished many of the piers and at present only two remain. Current production of the Summerland field approximates 20 bbl. per day and during its life it has produced about 3,200,000 bbl. of crude oil. In late years the field has gone to water due in part to infiltration of the ocean water. When piers were wrecked in years gone by the casing of wells was snapped off and no attempt was made to plug the holes.

Santa Barbara County

Prospectors have again become interested in the possibility of finding additional oil fields in the coastal district especially in Santa Barbara and Ventura counties. In Santa Barbara and Ventura counties the Vaqueros and Sespe oil sands are found at comparatively shallow depths and hence one can drill several wildcats in the coastal district for the cost of one deep well in the San Joaquin Valley. Most of the producing districts in Ventura County are relatively small in area but very numerous. The coastal district can be divided into two separate divisions. These are the tidewater accumulations and the large Santa Clara Valley in which are found many small fields and a few large ones. The Ventura Avenue anticline is the greatest accumulation and along this anticline is found the prolific Ventura Avenue field, the San Miguelito field and at the west end the Rincon field. Subsequent developments may indicate that the Ventura Avenue and the San Miguelito fields are one large field instead of two separate accumulations. Production characteristics of the San Miguelito field are quite similar to those of the Ventura Avenue field and contours in the west end of Ventura Avenue appear to be swinging around San Miguelito.

COASTAL DISTRICT COMPLETIONS

Santa Barbara Mesa Field

Trans-Oceanic Oil Co. 1-A Wallace 28-4n-27w
Pumped 25 bbl., 17.2-gravity, 5 per cent cut. Elev. 150 ft. T.D. 1,705 ft. 7-in. water string 1,670 ft. 35 ft. 5¾-in. gravel-packed liner 1,704 ft. Perf. 1,684-1,704 ft. 1,670 ft. 2½-in. tubing. Completed in Mesa zone. 24 days from spud to completion. Santa Barbara County.

COASTAL DISTRICT WILDCATS

Del Valle District

Universal Consd. Oil Co. 1 Dennis 21-4n-17w
Derrick. Los Angeles County.

Oak Canyon District

Western Gulf 1 Lechler 31-5n-17w
T.D. 2,442 ft. in gray sand. P.B. 2,415 ft. Cored 78 ft. of good looking oil sand between 2,290 and 2,390 ft. On formation test 2,290-2,390 ft. flowed 10 bbl. per hour of 23.6-gravity oil and 7,000,000 cu. ft. gas. 8⅝-in. casing cemented 2,295 ft. This is best looking wildcat in state at present time and possibility of opening up new oil field is conceded good. Los Angeles County.

La.-Ark. Fields

(Continued from Page 60)

Wildcat—La Salle Parish

The Hunter Co. 1 Pipes ..... SW SE 18-8n-3e
T.D. 4,009 ft., dry, top Wilcox 2,300 ft., no shows.

Wildcat—Tensas Parish

H. L. Hunt 2 Ayers Timber Co. ..... NW NE 18-14-11
T.D. 4,305 ft., dry.

Sibley—Webster Parish

Moffitt & Perritt 1 Kennon ..... S½ NW SE 35-18-9
30,000,000 cu. ft. gas open flow, T.P. 1,800 lb., C.P. 2,000 lb., 5½-in. casing 5,822 ft., T.D. 5,824 ft., perf. 5,492-5,644 ft.

ARKANSAS COMPLETIONS

Wildcat—Clark County

Coker & Grieves 2 W. H. Guess ..... SE SW NE 2-11-20
T.D. 676 ft., dry.

Magnolia—Columbia County

Louark Producing Co. 1-B D. E. Booth ..... NW NE 20-17-19
600 bbl., 3/16-in. choke, C.&T.P. 1,000 lb., T.D. 7,517 ft., 6-in. casing 7,488 ft.

Smackover—Ouachita County

A. D. Mason 2 Cooke Est. ..... SE NW SW 27-15-18
T.D. 2,278 ft., dry.

East El Dorado—Union County

Adams & Coffee 1 M. C. Schmidt NE SW NW 15-17-14
T.D. 3,075 ft., dry, 8¼-in. casing 91 ft.

Urbana—Union County

C. H. Lyons et al 1-A P. Winn ..... SW SW NW 11-18-13
T.D. 3,608 ft., dry, 10-in. casing 141 ft.

EAST TEXAS BORDER WILDCAT REPORT

Marion County

J. D. Parsons 1 T. W. Hook, Alexander Albright Sur., S.D. 5,006 ft.
P. L. Withers et al 1 T. G. Allen, Robert Potter Sur., bailing salt water, T.D. 1,026 ft.

Sabine County

Sturm & Womack 1 J. H. Keith, L. Grace Sur., 10¾-in. casing 417 ft., W.O.C.

San Augustine County

Roper & Todd 1 Long Bell Lumber Co., N. Hayden Sur., moving in material.

Illinois Fields

(Continued from Page 79)

H. H. Wegener 1 C. W. & F. Coal Co. . . . . SW NE SW 19-6s-3e
Set 16-in. 32 ft., drilling 657 ft.

Gallatin County

Cameron Bros. 1 J. B. Green. Drilling 1,300 ft.
Cameron 2 Robinson . . . . . SE NW NW 4-8s-8e
Perf. 1,684-90 ft., 20-qt. shot, Palestine 1,710-20 ft.
W. E. Allund 1 E. Frye . . . . . NE SE NW 19-8s-10e
Clore 1,776 ft., 10-qt. shot 1,781-86 ft., testing.

Hancock County

Sam Tate et al 1 J. Rice . . . . . SW NE NW 28-4n-5w
S.D. 1,580 ft.

Jackson County

W. R. White 1 Dean . . . . . NE NW NW 18-9s-3w
S.D. 1,245 ft.
Magnolia 1 Smith Heirs . . . . . SE SE NE 9-8s-3w
Silurian 3,263 ft., Thebes 3,613 ft., drilling 3,687 ft.

Jasper County

Jasper Oil 1 Poehler . . . . . N½ NE NW 7-5n-10e
2,000 ft. fluid, est. 70% oil.
Pure 1 C. C. Price . . . . . W½ SW SW 16-6n-10e
Set 8⅝-in. 214 ft., drilling 2,063 ft.
L. M. Delatine 1 J. Huddleston . . S½ SW NE 9-8n-10e
Drilling 1,420 ft., 8-in. 82 ft.

Jefferson County

Whisenant & Trenchard 1 Grant NW NW SW 29-3s-3e
Moving in.
Vawter 1 Modglin . . . . . NW SE SW 9-1s-1e
S.D. 2,348 ft.

Johnson County

Benedum-Trees 1 Cavitt . . . . . SW SW NW 24-11s-3e
Rig.

Lawrence County

W. Payne 1 H. Payne . . . . . NW SW NW 20-3n-11w
S.D. 860 ft.
Robinson 1 Sauers . . . . . NW SE NW 20-3n-12w
Drilling 4,359 ft.

McDonough County

Ripley Dome Synd. 1 T. A. Jeffries . . . . . NW NE SW 21-4n-4w
Niagara 440 ft., slight show oil 465 ft., S.D. 485 ft.
C. B. Talbot 1 F. W. Powell . . . . . SE SE NE 29-4n-4w
S.D. 220 ft.

McLean County

Funks Grove O. & G. 1 Crawford . . . . . NW NW NW 28-22n-1e
Devonian 1,449 ft., 8-in. 1,450 ft., drilling 1,451 ft.

Macoupin County

Bridges & Valbert 1 Felker . . . . NW NE SW 1-9n-7w
Ste. Genevieve 985-1,010 ft., drilling 1,110 ft.

Madison County

Wickwire & Camberling 1 Ellis W½ NW SE 22-3n-6w
Drilling 610 ft.
Harr & Siegler 1 Bellin . . . . . NW NW SE 17-4n-5w
Set 8-in. 512 ft., drilling 635 ft.
E. A. Gilchrist 1 E. Hasto . . . . . NW NW SW 5-5n-5w
Drilling 135 ft.

Marion County

Paul Rossi 8 Brooks . . . . . SW NE SW 29-2n-2e
T.D. 4,618 ft., oil 4,050 ft., flowed 9 bbl. an hr., 5,000 gal. acid, testing.
J. Dunbar 1 Teschner . . . . . NW SW 37-3n-1e
Rig, standard tools.
Alisher & Booth 1 Hoffman . . . . NW NW NW 31-4n-3e
Set 10-in. 60 ft.

Montgomery County

Ginsberg et al 1 McDenver . . . . . SW NE SE 14-7n-2w
Set 7-in. 1,100 ft., Golconda 955 ft., Cypress 1,030 ft., Benoist 1,142 ft., S.D. 1,245 ft.
Keith 1 Varner . . . . . NE SE SW 3-8n-5w
Set 5½-in. 644 ft., show oil 661-74 ft.
J. Warner 1 R. DeFratus . . . . . SW SW SW 18-10n-4w
Set 8-in. 163 ft., drilling 470 ft.
F. Brown 1 Luddeke . . . . . SE NW NW 28-9n-4w
Mississippi lime 855 ft., slight show oil 606-08 ft., drilling 910 ft.
H. C. Detrick 1 W. H. Barnes . . . NW NE SE 20-10n-2w
S.D. 1,010 ft.

Pope County

L. V. Garnier 1 Peoples . . . . . NE NE NE 30-11s-5e
Slight show oil, S.D. 2,152 ft.

Randolph County

J. R. Rankin 1 B. Bierman . . . . . SW SW SE 3-7s-5w
Drilling 535 ft.

Richland County

O'Meara 1 C. Leaner . . . . . SW NW NE 24-4n-9e
Glen Dean 2,347 ft., Cypress 2,518 ft.
Oilwell Drilling 1 F. Hilborn . . . NW SW NE 24-4n-9e
Drilling 2,467 ft.

Saline County

Potter 1 Thaxton . . . . . E½ NW SW 28-8s-7e
Glen Dean 2,242 ft., Golconda 2,375 ft., Cypress sand 2,535 ft., drilling 2,698 ft.
Massy & Duggs 1 Hardesty . . . . W½ NE SW 20-7s-5e
Rig.

Shelby County

J. Moore et al 1 fee . . . . . SW SW NE 30-10n-3e
Set 8-in. 1,548 ft., S.D. 1,558 ft.
Guild et al 1 Hunter . . . . . NE SE NE 7-10n-3e
Fishing 1,345 ft.
P. Doran 1 Curry . . . . . SE SW SE 21-10n-6e
Location.

Tazewell County

Bartlemay 1 Mathis . . . . . SW NW SW 24-25n-3w
Drilling 640 ft.

Wabash County

Exchange 1 M. A. Strasser . . . . . SE SW SW 3-2s-13w
Palestine 1,820 ft., Glen Dean 2,183 ft., Golconda 2,274 ft., Cypress sand 2,399 ft., show oil.
Harris & Meyers 1 E. L. Denman . . . . . SW SW SE 17-1s-12w
Drilling 900 ft.
Hays & Yingling 1 Fischer . . SW NW NW 18-1s-13w
Set 10-in. 70 ft., drilling 2,095 ft.

Washington County

Taylor Drlg. 1 S. S. Barnett . . . . SW SE SW 20-3s-4w
Menard 570 ft., Glen Dean 694 ft., Golconda 770 ft., Barlow 897 ft., Cypress 912 ft., Paint Creek 983 ft., Benoist 1,032 ft., S.D. 1,058 ft.

Wayne County

Poorman & National 1 Lloyd . . . . NW NE NW 19-2s-8e
Drilling 750 ft.
C. R. Craft 1 J. F. Fischer . . . . . SE NW NW 34-1s-7e
S.D. 2,879 ft.

White County

Benedum-Trees 1 Stinson . . . . . SW SW NE 19-7s-11e
Location.
Mabee 1 Knight . . . . . SW SW SE 10-7s-9e
Kincaid 1,895 ft., Menard 2,041 ft., Waltersburg 2,195 ft., Tar Springs 2,257 ft., 2,315-30 ft. (show oil), Glen Dean 2,386 ft., Hardinsburg 2,416 ft., Golconda 2,468 ft., Barlow 2,601 ft., Cypress sand 2,617-23 ft. (show oil), drilling 2,760 ft.
Jungbecker 1 J. W. Hays . . . . . SE SE SW 16-7s-10e
Moving in.
Eason 1 DeLaff . . . . . NE SW NW 8-7s-8e
St. Louis 3,130 ft., set 7-in. 3,195 ft., T.D. 3,195 ft.
R. Halbert 1 Hubble . . . . . NE NW SW 7-6s-11e
Rig.
H. R. Rhodes 1 H. R. Golder . . . SW SE NE 29-5s-14w
Set 5½-in. 2,254 ft., pumped 112 bbl. in 12 hr. and 197 bbl. in 22½ hr., testing.
C. A. Evarts 1 E. Brown . . . . . SE NE NW 29-5s-14w
S.D. 1,820 ft.
Bell Bros. 1 E. H. Morris . . . . NW SW NW 21-5s-14w
Set 10-in. 140 ft., drilling 310 ft.
R. Warren 1 Brunker-Combe . . . . SE SE NW 36-5s-9e
Location.
J. G. Buell 1 E. Winters . . . . . NW NW SW 18-4s-10e
Base Pennsylvanian 1,983 ft., Degonia 2,112 ft., Palestine 2,227 ft., Menard 2,396 ft., Waltersburg 2,440 ft., drilling 2,542 ft.
O'Meara Bros. 1 O. L. Hon . . . . NW NE NE 30-4s-14w
Drilling 2,135 ft.
A. C. Burgen 1 Mary Kramer . . . . SE SW NE 36-3s-8e
Set 15½-in. 36 ft., 10-in. 101 ft., T.D. 2,923 ft.
Arrow Eastwood . . . . . SW SE SE 29-3s-14w
Glen Dean 2,350 ft., drilling 2,365 ft.

Williamson County

Austen Drlg. 1 Neiber . . . . . NW SE NW 12-10s-1e
S.D. 2,060 ft.

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AMERICAN
Heavy-Duty ROLLER BEARINGS

Summary of Operations, All Fields, December

SUMMARY OF COMPLETIONS

Wells Completed

	Comp.	Prod.	Dry	Gas
Appalachian	390	326	28	114
Ohio	131	250	41	63
Kentucky	67	353	27	34
Michigan	64	2,378	40	0
Illinois	229	33,637	72	0
Indiana	45	1,808	25	6
Kansas	142	93,506	36	8
Oklahoma	102	10,430	27	9
Nebraska	4	618	3	0
N. Central Texas	161	35,726	54	3
West Texas	112	98,665	14	0
Texas Panhandle	40	6,720	3	2
East Texas	48	3,482	7	2
East Texas Border	5	36	0	4
Upper Texas Gulf	72	17,671	9	1
Lower Texas Gulf	39	3,734	10	1
S. Central Texas	15	411	8	0
South Texas	49	3,527	18	2
S. E. New Mexico	27	7,886	3	1
Arkansas	9	1,969	2	1
North Louisiana	57	3,759	16	5
Louisiana Gulf	58	10,755	22	1
Mississippi	13	4,464	5	0
Montana	16	1,608	0	5
Wyoming	13	2,619	4	1
Colorado	1	0	1	0
N. W. New Mexico	1	0	1	0
Total Dec.	1,910	346,338	476	263
Total Nov.	2,207	431,247	504	234
Difference	297	84.909	28	29

Rigs and Wells Drilling

	Rigs	Drlg.	Ttl.
Appalachian	55	409	464
Ohio	44	154	198
Kentucky	10	87	97
Michigan	38	116	154
Illinois	36	218	254
Indiana	9	56	65
Kansas	19	190	209
Oklahoma	35	181	216
Nebraska	5	26	31
North Central Texas	0	323	323
West Texas	0	320	320
Texas Panhandle	0	76	76
East Texas	0	82	82
East Texas Border	0	4	4
Upper Texas Gulf	0	124	124
Lower Texas Gulf	0	77	77
South Central Texas	0	44	44
South Texas	0	52	52
S. E. New Mexico	0	88	88
N. W. New Mexico	2	12	14
Arkansas	0	21	21
North Louisiana	0	58	58
Louisiana Gulf	0	143	143
Mississippi	0	18	18
Montana	3	70	73
Wyoming	8	63	71
Colorado	0	39	39
Alabama	0	2	2
Utah	2	5	7
Total December	266	3,058	3,324
Total November	659	3,062	3,721
Difference	393	4	403

OHIO

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ashland	4	8	1	1	2	46
Athens	12	6	4	6	3	15
Coshocton	2	80	0	1	1	2
Guernsey	3	0	1	2	0	4
Knox	5	0	1	4	6	12
Licking	16	0	5	11	5	17
Lorain	8	5	2	4	2	4
Medina	14	88	1	1	3	7
Meigs	4	0	0	4	1	7
Monroe	6	1	5	0	0	5
Morgan	4	2	2	1	0	1
Muskingum	4	0	1	3	4	9
Noble	6	10	1	4	2	5
Perry	6	5	4	1	3	9
Tuscarawas	5	0	1	4	0	7
Washington	12	40	5	5	2	9
Miscellaneous	20	5	7	11	10	37
Ttl. Dec.	131	250	41	63	44	154
Ttl. Nov.	113	519	36	59	51	172
Difference	18	269	5	2	7	18

EASTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Magoffin	0	0	0	0	1	3
Martin	8	60	1	6	1	4
Estill	4	7	3	0	0	1
Lee	0	0	0	0	0	3
Floyd	6	6	1	4	0	9
Knott	5	0	0	5	2	4
Pike	7	0	1	6	1	12
Johnson	1	0	0	1	0	0
Morgan	1	0	1	0	0	1
Miscellaneous	0	0	0	0	2	5
Ttl. Dec.	32	73	7	22	7	43
Ttl. Nov.	25	37	6	16	7	48
Difference	7	34	1	6	0	5

Production above gas wells, combined, 27,144,000 cu. ft.

WESTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Butler	2	20	1	0	0	2
Christian	0	0	0	0	0	1
Daviess	9	170	3	0	1	15
Grayson	1	0	1	0	0	1
Hancock	2	0	2	0	0	2
Henderson	0	0	0	0	0	4
Hopkins	0	0	0	0	0	1
Larue	0	0	0	0	0	1
McLean	5	25	3	1	1	6
Muhlenberg	1	0	1	0	0	2
Ohio	14	65	8	1	1	7
Webster	1	0	1	0	0	2
Ttl. Dec.	35	280	20	2	3	44
Ttl. Nov.	34	1,375	19	0	4	52
Difference	1	1,095	1	2	1	8

APPALACHIAN FIELDS

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bradford	*184	203	0	0	17	145
Allegany	*42	58	0	0	3	16
N. Oriskany	8	0	2	6	2	15
Middle Dist.	16	13	3	1	3	6
Butler-Armstrong	5	4	0	2	3	6
S.W. Pa.	44	0	6	38	8	51
W. Va.	91	48	17	65	19	170
Ttl. Dec.	390	326	28	114	55	409
Ttl. Nov.	390	377	25	75	51	415
Difference	0	51	3	39	4	6

MICHIGAN

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Allegan	18	1,155	9	0	9	23
Arenac	5	20	3	0	1	7
Barry	0	0	0	0	1	1
Bay	0	0	0	0	1	3
Berrien	0	0	0	0	0	2
Cass	0	0	0	0	0	3
Clare	3	333	1	0	2	7
Gladwin	1	0	1	0	1	3
Gratiot	1	0	1	0	0	1
Huron	1	0	1	0	0	4
Ingham	1	0	1	0	0	1
Isabella	2	0	2	0	5	4
Kent	6	140	4	0	1	2
Lenawee	0	0	0	0	1	4
Mason	0	0	0	0	0	2
Midland	0	0	0	0	2	2
Missaukee	1	0	1	0	0	0
Monroe	2	20	1	0	0	2
Montcalm	2	0	2	0	2	4
Muskegon	0	0	0	0	1	4
Oceana	0	0	0	0	2	0
Ogemaw	3	30	2	0	0	0
Ottawa	6	274	1	0	3	12
Saginaw	1	0	1	0	1	0
Shiawassee	1	0	1	0	0	3
Van Buren	10	406	8	0	4	9
Miscellaneous	0	0	0	0	1	13
Ttl. Dec.	64	2,378	40	0	38	116
Ttl. Nov.	73	4,807	38	7	37	120
Difference	9	2,429	2	7	1	4

ILLINOIS

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	0	1	0	0	0
Bond	3	0	3	0	0	5
Clark	0	0	0	0	0	6
Clay	1	28	0	0	0	0
Clinton	6	252	2	0	1	1
Coles	2	0	2	0	0	1
Crawford	0	0	0	0	0	2
Edgar	2	0	2	0	0	0
Edwards	8	423	4	0	1	2
Effingham	2	281	1	0	0	3
Fayette	23	3,408	6	0	3	14
Franklin	6	515	2	0	1	1
Gallatin	3	273	1	0	2	5
Greene	1	0	1	0	0	1
Hamilton	19	4,227	1	0	5	20
Jackson	0	0	0	0	2	3
Jasper	13	6,330	6	0	1	6
Jefferson	2	160	1	0	0	1
Lawrence	1	5	0	0	0	3
McDonough	0	0	0	0	0	4
Macon	1	0	1	0	0	1
Macoupin	1	0	1	0	0	1
Madison	1	0	1	0	1	4
Marion	8	778	3	0	0	5
Montgomery	3	0	3	0	1	6
Perry	4	54	3	0	0	0
Pope	1	0	1	0	0	1
Randolph	0	0	0	0	0	4
Richland	6	614	1	0	2	13
St. Clair	2	0	2	0	1	2
Saline	1	0	1	0	1	1
Shelby	0	0	0	0	0	5
Wabash	10	99	7	0	3	9
Washington	7	464	3	0	3	3
Wayne	21	3,817	5	0	1	13
White	70	11,909	7	0	7	61
Miscellaneous	0	0	0	0	0	11
Ttl. Dec.	229	33,637	72	0	36	218
Ttl. Nov.	261	39,756	67	1	43	296
Difference	32	6.119	5	1	7	78

INDIANA

	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	1	0	1	0	0	0
Benton	1	0	1	0	0	0
Daviess	0	0	0	0	0	3
Dearborne	1	0	1	0	0	0
Decatur	3	0	0	3	0	0
Gibson	9	1,163	2	0	5	18
Greene	0	0	0	0	0	2
Hamilton	1	0	1	0	0	0
Hancock	1	0	1	0	0	0
Harrison	3	0	1	2	0	0
Jay	1	0	1	0	0	3
Knox	5	35	4	0	0	0
Martin	1	0	1	0	0	1
Newton	0	0	0	0	1	1
Pike	1	0	1	0	1	2
Posey	7	577	3	0	1	10
Spencer	3	33	6	1	0	3
Sullivan	1	0	1	0	0	2
Vigo	0	0	0	0	1	2
Miscellaneous	0	0	0	0	0	9
Ttl. Dec.	45	1,808	25	6	9	56
Ttl. Nov.	53	4,771	20	4	3	67
Difference	8	2,963	5	2	6	11

KANSAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Barber	2	516	1	0	0	2
Barton	21	13,053	7	0	4	15
Butler	8	400	2	0	0	14
Cowley	4	74	2	0	0	4
Douglas	3	0	3	0	0	0
Edwards	1	0	1	0	0	0
Ellis	14	9,912	3	0	0	11
Ellsworth	13	19,910	1	0	1	9
Grant	1	0	0	1	0	0
Greenwood	7	1,083	1	0	1	8
Kingman	2	0	1	0	1	8
McPherson	9	5,531	2	1	1	13
Marion	3	870	1	0	1	5
Ness	1	0	1	0	0	0
Pawnee	1	1,402	0	0	0	0
Pratt	5	1,074	0	3	0	4
Reno	0	0	0	0	0	2
Rice	7	909	2	1	1	13
Rooks	6	3,270	3	0	0	5
Russell	21	22,769	2	0	4	24
Stafford	10	12,733	1	0	3	10
Sumner	2	0	2	0	0	0
Saline	1	0	1	0	0	0
Misc.	0	0	0	0	3	46
Misc.	0	0	0	0	3	50
Ttl. Dec.	142	93,506	36	8	19	190
Ttl. Nov.	154	133,179	25	10	33	173
Difference	12	39,673	11	2	14	17

OKLAHOMA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Caddo	1	0	0	1	0	7
Carter	22	2,563	4	1	3	12
Cotton	1	0	1	0	0	0
Creek	4	145	2	0	3	15
Garvin	1	60	0	0	0	1
Grady	3	15	0	2	0	2
Hughes	2	0	1	1	0	2
Jackson	5	597	1	0	1	6
Kay	0	0	0	0	1	15
Kiowa	0	0	0	0	0	2
Lincoln	6	251	1	1	0	5
Logan	3	330	1	0	0	4
Le Flore	1	0	1	0	0	0
Marshall-Bryan	4	642	0	0	2	8
McIntosh	1	0	0	1	0	0
Okfuskee	12	3,328	4	1	2	13
Oklahoma	3	612	0	0	6	26
Okmulgee	0	0	0	0	6	18
Osage	0	0	0	0	0	6
Pawnee	0	0	0	0	2	3
Payne	5	300	2	1	0	2
Pittsburg	1	0	0	1	0	0
Pontotoc	6	137	3	0	2	3
Potta-watomie	10	768	2	0	4	10
Seminole	6	545	2	0	2	10
Stephens	4	33	2	0	1	7
Tillman	1	104	0	0	0	4
Tulsa	0	0	0	0	0	11
Wagoner	0	0	0	0	1	8
Misc.	0	0	0	0	8	27
Ttl. Dec.	102	10,430	27	9	35	181
Ttl. Nov.	163	13,848	33	24	34	212
Difference	61	3,418	6	15	1	31

NORTH CENTRAL TEXAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Archer	23	16	6,203	0	7	68
Brown	3	1	10	0	0	8
Baylor	1	1	806	0	0	6
Callahan	2	0	0	0	2	7
Clay	18	12	4,955	*1	5	17
Coleman	5	3	482	*1	1	9
Comanche	0	0	0	0	0	2
Cooke	16	12	2,285	0	4	15
Denton	0	0	0	0	0	2
Eastland	1	1	70	0	0	2
Fisher	0	0	0	0	0	2
Hamilton	0	0	0	0	0	4
Haskell	1	0	0	0	1	0
Hood	0	0	0	0	0	2
Jack	2	2	804	0	0	20
Jones	6	3	595	0	3	13
Montague	7	6	6,325	0	1	21
Palo Pinto	1	1	15	0	0	5
Parker	0	0	0	0	0	2
Runnels	0	0	0	0	0	3
San Saba	1	0	0	0	1	0
Shackelford	10	3	140	*1	6	13
Stephens	1	1	10	0	0	5
Tarrant	1	0	0	0	1	2
Taylor	4	2	629	0	2	2
Throckmorton	0	0	0	0	0	6
Wichita	32	24	9,436	0	8	34
Wilbarger	6	4	961	0	2	13
Wise	0	0	0	0	0	2
Young	20	12	2,000	0	8	28
Miscellaneous	0	0	0	0	0	6
Ttl. Dec.	161	104	35,726	3	54	323
Ttl. Nov.	219	147	57,834	3	69	409
Difference	58	43	22,108	0	15	86

*Gas in million cubic feet. Clay, 0.1; Coleman, 1.5; Shackelford, 2.0.

WEST TEXAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Andrews	3	1	1,386	0	2	5
Crane	5	4	13,798	0	1	18
Cochran	4	4	1,480	0	0	12
Crockett	3	3	9,536	0	0	17
Culberson	0	0	0	0	0	2
Ector	30	28	25,139	0	2	36
Gaines	15	13	7,731	0	2	30
Hockley	9	8	7,777	0	1	32
Howard	0	0	0	0	0	2
Hudspeth	0	0	0	0	0	2
Loving	0	0	0	0	0	2
Mitchell	0	0	0	0	0	8
Pecos	8	7	624	0	1	30
Scurry	1	1	150	0	0	22
Sutton	0	0	0	0	0	2
Terrell	0	0	0	0	0	3
Terry	2	0	0	0	2	1
Tom Green	0	0	0	0	0	2
Upton	3	3	5,476	0	0	11
Ward	8	6	7,328	0	2	11
Winkler	4	4	3,541	0	0	18
Yoakum	17	16	14,699	0	1	48
Miscellaneous	0	0	0	0	0	6
Ttl. Dec.	112	98	98,665	0	14	320
Ttl. Nov.	119	114	85.705	1	4	341
Difference	7	16	12,960	1	10	21

TEXAS PANHANDLE

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Carson	9	9	1,699	0	0	11
Gray	9	8	703	*1	0	23
Hutchinson	18	17	4,002	*1	0	31
Moore	0	0	0	0	0	2
Ochiltree	1	0	0	0	1	0
Wheeler	3	1	316	0	2	7
Miscellaneous	0	0	0	0	0	2
Ttl. Dec.	40	35	6,720	2	3	76
Ttl. Nov.	25	20	4,528	3	2	86
Difference	15	15	2,192	1	1	10

*Gas in million cubic feet. Gray, 2.1; Hutchinson, 9.1.

EASTERN TEXAS

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Anderson	3	2	204	0	1	6
Fannin	0	0	0	0	0	2
Franklin	4	4	1,532	0	0	2
Freestone	4	3	356	0	1	6
Gregg	26	26	1,151	0	0	17
Henderson	2	0	0	*2	0	1
Houston	0	0	0	0	0	2
Leon	1	0	0	0	1	0
Limestone	0	0	0	0	0	4
Navarro	4	0	0	0	4	7
Rusk	1	1	35	0	0	5
Smith	1	1	30	0	0	15
Upshur	1	1	30	0	0	2
Wood	1	1	144	0	0	4
Miscellaneous	0	0	0	0	0	9
Ttl. Dec.	48	39	3,482	2	7	82
Ttl. Nov.	43	35	3,133	0	8	84
Difference	5	4	349	2	1	2

*Gas in million cubic feet. Henderson, 283.0.

EAST TEXAS BORDER

County—	Comp.	Oil	Prod.	Gas	*Dry	Dlg.
Harrison	2	0	0	2	0	1
Marion	1	1	36	0	0	2
Panola	1	0	0	1	0	0
San Augustine	0	0	0	0	0	1
Shelby	1	0	0	1	0	0
Ttl. Dec.	5	1	36	4	0	4
Ttl. Nov.	7	1	10	1	5	10
Difference	2	0	26	3	5	6

*Gas production (million cu. ft.): Harrison County, 26.3; Panola County, no gage; Shelby County, 8.0.

TEXAS GULF COAST

	Comp.	Prod.	Dry	Gas	Dlg.
Anahuac	2	1,067	0	0	2
Batson	1	10	0	0	2
Clear Lake	1	0	1	0	0
Dickinson	0	0	0	0	3
Esperson	2	1,209	0	0	2
Fannett	1	819	0	0	3
Fairbanks	2	298	0	0	2
Fishers Reef	2	144	1	0	2
Ganado	1	63	0	0	1
Hardin	1	278	0	0	2
Hastings	1	635	0	0	0
Hillje	1	85	0	0	2
Hull	3	320	0	0	2
Humble	1	65	0	0	2
La Belle	1	249	0	0	1
Lolita	11	3,086	0	0	6
Lovells Lake	1	139	0	0	2
Magnet	2	188	0	0	1
Manvel	1	555	0	0	1
Ogburn	1	57	0	0	2
North Markham	1	223	0	0	1
Old Ocean	5	1,534	0	0	12
Red Fish Reef	1	156	0	0	5
Segno	1	295	0	0	3
South China	2	212	1	0	2
Spurger	2	368	0	1	2
Tomball	1	44	0	0	2
West Beaumont	1	29	0	0	1
West Ganado	1	0	1	0	0
West Ranch	9	4,137	0	0	13
West Columbia	2	775	0	0	3
Withers	6	631	1	0	4
Miscellaneous	4	0	4	0	38
Total Dec.	72	17,671	9	1	124
Total Nov.	103	26,199	18	2	135
Difference	31	8,528	9	1	11

LOWER TEXAS GULF COAST

	Comp.	Prod.	Dry	Gas	Dlg.
Agua Dulce	3	325	0	0	4
Ben Bolt	2	730	0	0	1
Clara Driscoll	2	104	0	0	7
East Alice	1	10	0	0	0
East Premont	1	264	0	0	1

East White Point	2	277	0	0	2
East Flour Bluff	2	275	1	0	2
Heyser	1	158	0	0	1
Luby	1	0	0	1	1
Orange Grove	1	0	1	0	0
Refugio	1	20	0	0	1
Richard King	1	118	0	0	1
Robstown	1	0	1	0	0
Sandia	1	3	0	0	0
S. Clara Driscoll	1	120	0	0	2
Stratton	5	623	0	0	7
Telferner	1	0	1	0	0
Tomoconnor	1	215	0	0	2
Victoria	1	112	0	0	0
Wade City	4	380	0	0	3
Miscellaneous	6	0	6	0	42
Total Dec.	39	3,734	10	1	77
Total Nov.	49	4,801	11	2	75
Difference	10	1,067	1	1	2

SOUTH CENTRAL TEXAS

	Comp.	Prod.	Dry	Gas	Dlg.
Bee Creek	1	0	1	0	1
Darst Creek	1	50	0	0	2
Elm Creek	1	0	1	0	1
Gas Ridge	1	1	0	0	2
La Coste	1	2	0	0	1
Luling	1	40	0	0	1
Pearsall	1	44	0	0	3
Rockdale	1	4	0	0	1
Thrall	1	0	1	0	0
Tinney Creek	1	270	0	0	1
Miscellaneous	5	0	5	0	31
Total Dec.	15	411	8	0	41
Total Nov.	10	576	5	0	47
Difference	5	165	3	0	3

SOUTH TEXAS

	Comp.	Prod.	Dry	Gas	Dlg.
Boyle	1	48	0	0	2
Calliham	1	4	0	0	1
Casa Blanca	2	75	1	0	1
Cedro Hill	3	57	0	1	2
Colorado	11	2,167	0	0	4
Escobas	2	82	0	0	1
Glen	2	173	0	0	2
Hoffman	1	50	0	0	1
Kelsey	1	173	0	0	2
Kreis	1	8	0	0	0
Longhorn	1	0	1	0	0
Lundell	2	0	2	0	0
Labbe	1	123	0	0	0
Manila	1	32	0	0	2
North Rincon	1	14	0	0	1
Oakville	1	0	1	0	1
Rincon	2	324	0	0	2
South Calliham	2	0	1	1	1
Sun	1	197	0	0	1
Tesoro	1	0	1	0	0
Yzaguirre	1	0	1	0	0
Miscellaneous	10	0	10	0	28
Total Dec.	49	3,527	18	2	52
Total Nov.	86	4,662	33	4	55
Difference	37	1,135	15	2	3

SOUTHEAST NEW MEXICO

	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Chaves	0	0	0	0	0	6
Dona Ana	0	0	0	0	0	3
Eddy	10	6	750	*1	3	45
Lea	17	17	7,136	0	0	31
Otero	0	0	0	0	0	2
Socorro	0	0	0	0	0	1
Ttl. Dec.	27	23	7,886	1	3	88
Ttl. Nov.	27	22	7,357	1	4	105
Difference	0	1	429	0	1	17

*Gas in million cubic feet. Eddy, 5.0.

NORTH LOUISIANA

Parish—	Comp.	Oil	Prod.	Gas*	Dry	Dlg.
Bossier	2	0	0	0	1	6
Caddo	26	19	867	1	6	15
Caddo-Rodessa	1	0	0	1	0	0
Caldwell	1	0	0	0	1	0
Claiborne	2	1	285	1	0	5
De Soto	0	0	0	0	0	3
Franklin	1	0	0	0	1	0
Grant	0	0	0	0	0	2
La Salle	19	15	2,607	0	4	12
Natchitoches	1	0	0	0	1	0
Ouachita	1	0	0	1	0	0
Red River	0	0	0	0	0	3
Tensas	1	0	0	0	1	2
Union	2	0	0	1	1	1
Webster	0	0	0	0	0	6
Miscellaneous	0	0	0	0	0	3
Ttl. Dec.	57	35	3,759	5	16	58
Ttl. Nov.	82	52	6,699	9	21	93
Difference	25	17	2,940	4	5	27

*Gas production (million cu. ft.): Caddo Parish, 254.0; Caddo-Rodessa, 10.0; Claiborne Parish, 1.8; Ouachita Parish, 8.0; Union Parish, 7.0.

ARKANSAS

County—	Comp.	Oil	Prod.	Gas*	Dry	Dlg.
Clark	0	0	0	0	0	2
Columbia	1	1	288	0	0	5
Lafayette	2	1	703	1	0	1
Lonoke	1	0	0	0	1	0
Union	5	4	978	0	1	0
Miscellaneous	0	0	0	0	0	4
Ttl. Dec.	9	6	1,969	1	2	21
Ttl. Nov.	16	10	1,577	0	6	30
Difference	7	4	392	1	4	9

*Gas production (million cu. ft.): Lafayette County, 2.3.

LOUISIANA GULF COAST

	Comp.	Prod.	Dry	Gas	Dlg.
Anse La Butte	2	192	1	0	12
Bayou Blue	2	360	0	0	3
Bay St. Elaine	1	0	1	0	1
Bayou Pigeon	1	178	0	0	1
Charenton	1	0	1	0	4
Chalkley	1	0	1	0	2
Cheneyville	1	260	0	0	1
Darrow	1	355	0	0	1
E. Baton Rouge	3	415	1	0	2
Edgerly	1	195	0	0	1
Eola	1	324	0	0	3
Fausse Point	2	0	2	0	1
Golden Meadow	2	118	1	0	4
Hackberry	1	461	0	0	3
Happytown	1	324	0	0	1
Iowa	2	356	1	0	4
Jennings	2	462	0	0	2
Neale	2	0	2	0	0
North Crowley	2	1,214	0	0	1
New Iberia	1	680	0	0	1
Paradis	2	843	1	0	1
Port Barre	1	389	0	0	2
Quarantine Bay	1	453	0	0	3
Ritchie	1	42	0	0	2
Section 28	1	0	0	1	1
South Crowley	1	76	0	0	1
Sorrento	1	10	0	0	1
Starks	1	0	1	0	1
Sulphur	2	224	1	0	2
Ville Platte	5	1,651	0	0	9
Vinton	1	0	1	0	0
West Bay	1	732	0	0	1
W. Lake Verret	1	25	0	0	2
Woodlawn	2	416	0	0	1
Miscellaneous	1	0	7	0	68
Total Dec.	58	10,755	22	1	143
Total Nov.	83	15,825	27	1	143
Difference	25	5,070	5	0	0

MISSISSIPPI

County—	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Hinds	1	0	0	0	1	1
Montgomery	1	0	0	0	1	0
Pike	1	0	0	0	1	0
Yazoo	10	8	4,464	0	2	5
Miscellaneous	0	0	0	0	0	12
Ttl. Dec.	13	8	4,464	0	5	18
Ttl. Nov.	17	11	5,014	1	5	35
Difference	4	3	550	1	0	17

ALABAMA

County—	Comp.	Oil	Prod.	Gas	Dry	Dlg.
Walker	1	0	0	0	1	0
Miscellaneous	0	0	0	0	0	2
Ttl. Dec.	1	0	0	0	1	2
Ttl. Nov.	0	0	0	0	0	7
Difference	1	0	0	0	1	5

No completions or active drilling operations in Florida or Georgia, during December.

MONTANA

County—	Comp.	Prod.	Dry	Gas	Rgs	Dlg.
Big Horn	0	0	0	0	0	2
Blaine	0	0	0	0	0	4
Carbon	0	0	0	0	0	4
Fallon	4	0	0	4	0	2
Fergus	0	0	0	0	0	3
Glacier	10	1,503	0	0	3	14
Petroleum	0	0	0	0	0	2
Phillips	1	0	0	1	0	11
Toole	1	105	0	0	0	19
Miscellaneous	0	0	0	0	0	9
Ttl. Dec.	16	1,608	0	5	3	70
Ttl. Nov.	29	1,972	2	10	3	70
Difference	13	364	2	5	0	0

WYOMING

County—	Comp.	Prod.	Dry	Gas	Rgs	Dlg.
Big Horn	0	0	0	0	0	3
Carbon	0	0	0	0	2	10
Converse	1	0	1	0	1	1
Crook	2	20	1	0	0	1
Hot Springs	0	0	0	0	0	3
Natrona	2	217	0	0	0	4
Niobrara	2	1,944	0	0	2	5
Sublette	1	120	0	0	2	5
Sweetwater	2	320	0	1	1	5
Uinta	1	0	1	0	0	6
Weston	2	70	1	0	0	10
Miscellaneous	0	0	0	0	0	11
Ttl. Dec.	13	2,691	4	1	8	63
Ttl. Nov.	21	5,934	6	1	8	66
Difference	8	3,243	2	0	0	3

COLORADO

County—	Comp.	Prod.	Dry	Gas	Rgs	Dlg.
Huerfano	1	0	1	0	0	8
Rio Blanco	0	0	0	0	0	5
Miscellaneous	0	0	0	0	0	26
Ttl. Dec.	1	0	1	0	0	39
Ttl. Nov.	4	438	1	1	0	39
Difference	3	438	0	1	0	0

NORTHWEST NEW MEXICO

County—	Comp.	Prod.	Dry	Gas	Rgs	Dlg.
Bernalillo	0	0	0	0	1	1
San Juan	1	0	1	0	0	4
Torrance	0	0	0	0	1	2
Miscellaneous	0	0	0	0	0	5
Ttl. Dec.	1	0	1	0	2	12
Ttl. Nov.	0	0	0	0	2	11
Difference	1	0	1	0	0	1

MISSISSIPPI AND SOUTHEAST

Alabama Gas Well; Tinsley Outpost Share Spotlight

By GEORGE WEBER

JACKSON, Jan. 20.—The Tinsley field, Yazoo County, Mississippi, remains the focus of interest this week, with indicated new extension attempts to the south, and increased drilling activity. In Fayette County, Alabama, a small gas well is attracting interest. Wildcatting throughout Mississippi continued along the same trend, with no abandonments during the past week, and new operations beginning or reported due in several counties.

Tinsley Activity

Additional locations staked in the southeast sector of the Tinsley field indicate sustained or increased drilling. In addition E. C. Johnston and Sam Killingsworth have completed plans to drill an outpost about 1 mile south of present field limits, in the northeast quarter of 36-10n-3w. This outpost, if successful, should incite further exploration to the south and west and the extent of Woodruff saturation in these directions is of considerable interest.

The discovery well at Tinsley lies just east of an area in which the sand is missing. Wells in that area were completed in the lower Stevens sand. The early development of the field showed a trend to the north and east in which directions the Woodruff sand thickened. That section of the field, north of the main northwest-southeast fault was then developed rapidly, while extension to the west, north of the barren Woodruff area was delayed by litigation. Wells to the west showed increasing Woodruff section, but until titles are cleared, development in that direction must be postponed.

The next and most recent trend in Tinsley development then turned south and east, and good Woodruff sand sections were cored in wells extending almost to the dry Whigate Oil Co. 1 Robertson, which is now believed to be located just east of the major fault. Had the Whigate well been located two locations west, it would have proven a major extension to the field, and the southeast play would probably have begun much earlier.

The possibility of Woodruff sand production south and west of the area in Sections 13 and 14-10n-3w, is still a matter of conjecture, but its thickening to the north, east and southeast indicate that the same trend may exist to the south and west. The new outpost south of the current center of activity is 2 miles south-southeast of the area of missing Woodruff sand.

Tinsley production continues to exceed the present market demand, a result of unequal crude outlets among producers. One operator, with a private outlet for crude, has contracted to move additional crude from a south lease to Illinois by tank car, thus aggravating the condition. Other operators, restricted to daily marketable outlet of 70 bbl. per well, are moving much crude to storage to protect their interests from large offsetting lease production. This situation developed several months ago when daily field production increased to a maximum of 25,500 bbl. in September 1940. The bulk of the overproduction came from the area north of the major fault, however, and an agreement among operators to reduce production temporarily returned the field to a total production more nearly in line with market demand. The current situation, however, has extended to the area south of the fault, and overproduction and runs to storage again face operators in increasing proportions.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Tinsley	1	148	4,613
Dry holes: Wildcats	2		13,337
Total	3		17,950

Wildcatting

Wildcat failures in Forrest and Hinds counties were partially offset by announcement of new operations in the state. In Hinds County, Hassie Hunt 1 Montgomery was abandoned at 4,567 ft., after a slight show of gas was encountered in the Wilcox. This show, although unimportant in the wildcat, will increase interest in the coming Wilcox test in Warren County. W. O. Allen 1 Culley, located on the Glass dome will be reentered, and the Wilcox section will be more closely examined. The formation was topped in the abandoned test, at 3,270 ft., and shows were reported, but not sufficiently tested. The success in finding new production about 600 ft. below the top of the Wilcox to the west in La Salle Parish, Louisiana, has revived interest in the Allen test, and Hassie Hunt is expected to move the rig from his abandoned Montgomery wildcat, to begin operations shortly.

Alabama Gasser

In Fayette County, Alabama, B. L. Fillingame 1 Alabama Educational Association is reported making about 2,000,000 cu. ft. of gas from the Pottsville sand topped at 1,552 ft. The hole is full of water, which is from a section up the hole from the Pottsville. Total depth is 1,553 ft.

MISSISSIPPI COMPLETIONS

Wildcat—Forrest County

Fohs Oil Co. 1 Batson-Hatten, NW SE 10-1s-12w, T.D. 8,770 ft., dry.

Wildcat—Hinds County

Hassie Hunt 1 Montgomery, NW SW 12-5n-4w, T.D. 4,567 ft., slight show gas in Wilcox 2,870 ft., dry.

Tinsley—Yazoo County

Union Producing 8 Perry, NW SW 24-10-3, 148 bbl., open tubing, T.D. 4,613 ft., 7-in. casing 4,571 ft., Woodruff sand 4,574-4,606 ft.

MISSISSIPPI DRILLING REPORT

Clarke County

Walsingham & Earles 1 School Land, SW NW NE 16-4n-15e, drilling 3,011 ft.

Issequena County

E. C. Johnston (formerly W. E. Hall et al) 1 Irby Charping, NE NW 29-10n-8w, working over at T.D. 5,020 ft., washing down to test show oil 5,012-20 ft.

Montgomery County

E. R. Henderson 1 Columbian Mutual

(Continued on Page 99)

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940 High	1940 Low	Week ended Jan. 18 High	Week ended Jan. 18 Low	Week ended Jan. 18 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
58½	38½	49⅝	48½	49⅝	Amerada Corp.	788,675	N.P.	50cQ	1-31-41	$2.00	$1.56	$2.07	74½	50	78	55
27⅛	18¼	23¾	23½	23⅝	Atlantic Refining	2,663,999	$25	25cQ	12-16-40	1.00	1.66	1.40	24¾	18⅛	27⅝	17⅝
16⅝	8½	10¼	9⅛	9⅛	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.50	1.39	—.85	21	10¼	23¾	12⅛
13⅜	7⅛	9½	8⅝	8⅞	Barnsdall Oil Co.	2,558,779	$5	15c	12-9-40	.60	.76	1.26	19½	11⅛	21⅜	10⅛
8⅛	5½	6	5¾	5⅞	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	2-15-41	.72½	.55	.55	9⅞	6½	10¾	7
25	16⅛	20½	19	19⅝	Continental Oil of Delaware	4,682,572	$5	25cQ	12-23-40	1.00	1.35	1.10	31½	19⅞	35¾	21¼
6⅞	3⅜	4¼	4	4⅛	Houston Oil	1,098,618	$25	....	10-17-30	....	.43	.83	9⅜	4½	9¾	5
14⅜	9	11	10¾	10⅞	Lion Oil Refining	435,815	N.P.	25cQ	12-31-40	1.00	1.50	2.09	18⅛	10	25⅛	15⅝
17⅝	11½	15	14⅜	14½	Mid-Continent Petroleum	1,857,912	$10	40c	12-2-40	.80	1.42	.56	18	11⅛	22⅝	12¼
11¾	7⅛	10⅞	10½	10⅝	Mission Corporation	1,378,645	$10	25c	12-20-40	.25	.87	1.04	14⅞	8¾	17¾	10⅜
9¾	4⅝	6½	5⅞	6	National Supply	1,155,517	$10	....	12-22-37	....	—.87	—.79	15½	5⅝	23	12½
8¾	5⅜	7⅝	7⅛	7¼	Ohio Oil Co.	6,563,377	N.P.	25c	12-14-40	....	—.10	.25	10½	6	14⅞	8⅞
8⅞	5½	7⅛	6¾	6¾	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	....	.81	1.22	11⅞	7	15⅞	10¼
10½	6¾	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	.25	1.10	.08	8¾	5	9¼	6¼
41¾	27⅛	40	36¾	37¾	Phillips Petroleum	4,449,052	N.P.	50cQ	11-30-40	2.00	2.21	2.03	46½	31¼	44⅜	27¼
22¾	15	16⅞	16⅝	16⅞	Plymouth Oil Co.	1,038,633	$5	25c‡	12-23-40	‡1.30	2.38	2.59	24	17⅛	25⅜	15
11½	6¾	8⅝	8	8¼	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.11	.38	11¾	6⅛	13½	8¼
9¼	5⅞	8⅞	8⅝	8⅞	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.65	.51	10¼	6⅝	9⅞	5
20	11	15¼	14¼	14½	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	12-14-40	1.00	1.40	1.52	24⅜	15½	27½	15½
13⅛	7⅝	12⅜	11½	11½	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.75	.77	.72	17¼	9⅞	18⅜	10
23¼	12¼	21⅞	20¼	20⅝	Skelly Oil	995,349	$15	50c	12-20-40	1.25	1.99	2.27	29½	15½	34¾	18½
12½	7⅛	9⅛	8⅞	8⅞	Socony-Vacuum	31,206,071	$15	25cSA	9-16-40	.50	1.10	1.29	15⅛	10¼	16⅜	10⅝
26⅛	16¼	20⅜	19¼	19¼	Standard Oil of California	13,003,953	N.P.	25cQ	12-16-40	1.00	1.38	2.22	33⅝	24¼	34⅞	25⅛
29	20¾	27¾	26¾	26⅞	Standard Oil (Indiana)	15,272,020	$25	50c†	12-16-40	1.50	2.23	1.82	30	22¾	35½	24¾
46½	29⅞	36⅜	34	34	Standard Oil of New Jersey	27,280,998	$25	75c†	12-16-40	1.75	3.26	2.86	53½	38	58⅜	39¾
65⅞	46¾	58½	58	58	Sun Oil	2,434,863	N.P.	25cQ	12-16-40	*1.00	2.74	1.07	66	45¾	65⅛	45
2½	1⅛	1¾	1⅝	1¾	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	.10	.04	.24	3⅝	1¾	4¼	1⅝
47⅝	33	39⅝	37⅝	37⅝	Texas Corp.	10,876,139	$25	50cQ	1-2-41	2.00	3.02	2.13	50¾	32½	49⅝	32⅝
4¼	2½	3¼	3⅛	3⅛	Texas Gulf Producing Co.	888,147	N.P.	10c	12-14-40	.20	.69	.86	5¾	3¼	5⅞	2⅝
8⅝	5⅜	6	5¾	5¾	Texas Pacific Coal & Oil	888,236	$10	10c	12-2-40	.40	1.00	1.16	11⅜	7	12½	7
12	8¾	10⅜	10	10⅛	Tide Water Associated	6,371,827	$10	15c	12-2-40	.70	1.05	1.28	14¼	9½	15¾	10⅛
17½	12	14½	13¾	13¾	Union Oil Co. of California	4,666,270	$25	25c	2-15-41	1.00	1.25	1.47	19¾	15⅛	22½	17⅛
29⅞	22¾	29⅝	28½	28½	Union Tank Car Co.	1,177,381	N.P.	45c	12-2-40	1.75	2.07	1.16	24¼	20⅛	23½	20
3⅝	1¾	..	..	..	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.77	.52	4¼	2⅜	3½	1⅝

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. —Deficit.

New York Curb Exchange

1940 High	1940 Low	Week ended Jan. 18 High	Week ended Jan. 18 Low	Week ended Jan. 18 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1939	Com. sh. earn. 1938	1939 High	1939 Low	1938 High	1938 Low
10¾	4½	7	6⅜	6½	American Republics Corp.	1,308,049	$10	25c	12-18-40	....	$0.14	—.22	11¾	5½	11¾	5
3¼	1⅜	1¾	1¾	1¾	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.95	—.14	7¼	2½	10¼	4⅞
43	28	40¼	40	40	Buckeye Pipe Line Co.	200,000	$50	$1	12-14-40	$4.00	3.13	2.36	34¾	26½	39	22½
117	95	109½	109½	109½	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	12-16-40	6.00	7.87	5.32	130	108⅝	128	97
6¾	4	5⅛	4¾	4¾	Cities Service (new)	3,703,978	$10	....	6-1-32	....	.68	.23	9¼	4¼	11	5⅛
2⅛	⅝	¾	⅝	⅝	Cosden Petroleum	465,332	$1	....	.....	....	....	....	2¼	½	2⅜	⅞
24¼	11⅝	15¼	14½	14⅞	Creole Petroleum	6,974,356	$5	50cSA†	12-16-40	1.00	1.38	1.64	28	16¾	27½	17½
4⅜	2⅞	4	4	4	Darby Petroleum	351,390	$5	25cSA	1-15-39	....	.03	.69	7⅛	3⅝	10¼	5½
2	¾	..	..	..	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.37	—.91	2⅝	1½	3½	1½
31	20¼	23¾	23¾	23¾	Eureka Pipe Line	50,000	$50	$3.50	2-1-41	2.25	.63	—.37	23	15⅛	31	16
39⅞	25⅛	33½	31¾	32⅝	Gulf Oil Corp.	9,076,202	$25	25cQ	12-27-40	1.25	1.69	1.43	45⅛	29¼	46⅞	33
68	47⅛	60	58	58¼	Humble Oil & Refining	8,987,840	N.P.	62½c	12-26-40	2.00	3.33	3.98	71	52½	72⅝	56
12⅜	5⅜	6¾	6½	6½	Imperial Oil of Canada	26,965,078	N.P.	25c	12-2-40	.62½	.71	.96	17	11⅜	19½	14⅛
7¾	3	3¾	3¾	3¾	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	*2.80	.33	.47	7¼	5½	9⅜	6
19¾	8¼	10¾	9¾	9¾	International Petroleum	14,324,088	N.P.	30c	12-21-40	1.25	1.19	1.98	27½	17	31¼	21
2¾	1⅝	..	..	..	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.06	.14	3¾	2⅛	5	2⅛
10¾	7⅝	10⅛	10	10⅛	Lone Star Gas	5,518,347	N.P.	30c	12-21-40	.70	.98	.88	10½	7⅛	10⅝	6⅝
6¼	3¾	4⅝	4½	4⅝	Louisiana Land & Exp.	2,966,762	$1	5c	12-16-40	.35	.22	.45	7¾	4	9⅜	6½
17	9¼	..	..	..	Margay Oil Corp.	149,943	N.P.	25cQ	1-10-41	1.00	1.52	2.28	17	14½	24	16
8½	6½	7⅜	7¼	7¼	Midwest Oil Co.	998,474	$10	45c	12-16-40	.90	.99	.93	8¾	6⅝	9¾	6⅝
6¼	4⅞	5⅝	5½	5½	Mountain Producers	1,593,584	$10	30cSA	12-16-40	.60	.70	.62	6	4⅞	5¾	4½
13⅛	10	12¼	11½	11⅝	National Fuel Gas	3,810,183	N.P.	25cQ	1-15-31	1.00	.95	.84	14	11¼	14⅝	11½
12¾	8¾	12¾	11½	12	National Transit	509,000	$12.50	50c	12-16-40	1.00	.91	.88	9½	7¼	9¼	6½
1¼	¾	..	..	..	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1¾	1	2⅝	1⅛
7¾	5¼	6¾	6⅝	6⅝	New York Transit	100,000	$5	25c	9-20-40	.60	.88	.16	6	4	4½	3½
9⅞	6	9¾	9	9	Northern Pipe Line	120,000	$10	40c	12-2-40	.80	.31	.24	7	4½	6	4
5½	2½	3⅛	3	3⅛	Pantepec Oil	2,856,872	$1	....	.....	....	....	....	7⅝	4	7⅜	3½
3¼	1⅛	1½	1⅛	1¼	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.70	.17	5	1¼	4½	1⅝
3	1½	2¼	2¼	2¼	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.16	.29	3	1⅞	4	2⅛
11¾	4¾	7¾	7¾	7¾	Southern Pipe Line	100,000	$10	25c	9-3-40	.50	.25	—.27	4⅞	3½	5⅜	3¼
44	28	39½	38⅜	38⅜	South Penn Oil	1,000,000	$25	$1.87½†	12-20-40	2.50	2.84	1.44	40½	26¾	39	28¾
35	21	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50c	12-26-40	6.50	2.06	—.41	23	18	22¼	16½
20⅞	16½	20⅜	20	20	Standard Oil of Kentucky	2,604,790	$10	55c†	12-16-40	1.30	1.53	1.45	20⅛	17¼	18¾	15
41¾	26¼	38⅞	38	38	Standard Oil of Ohio	753,740	$25	$1.25†	12-14-40	2.00	6.64	1.81	32¾	17	22¾	16¼
2	1⅜	1⅝	1½	1⅝	Sunray Oil	1,975,876	$1	5c	12-20-40	.10	.25	.23	2¾	1¾	3¼	2
3⅛	2	3	2⅞	3	Texon Oil & Land	936,024	$2	10c	12-30-40	.40	.49	.56	4	2⅝	5¼	3½
3⅜	2	2⅜	2⅜	2⅜	Transwestern Oil Co.	750,000	$10	....	.....	....	—1.42	.12	6	2½	5¼	2⅝
2⅛	¾	1 1/16	1 1/16	⅞	United Gas Corp.	7,818,959	$1	..	.....	....	—.55	—.51	3⅜	1½	5¼	2⅝

*Includes $2.50 capital distribution. †Includes extras. —Deficit.

Personal Paragraphs

J. R. KEANE has been reelected president of the Western Asphalt Association, and J. R. PEMBERTON and RUSH M. BLODGET were again made vice presidents. H. P. FRACKELTON was reelected secretary at the annual meeting held in Los Angeles recently.

FRED MILLER, of Continental Oil Co.; W. J. LARSON, of Union Oil Co.; J. F. GILSTRAP, of California Production Service Co.; PAUL ANDREWS, of Signal Oil & Gas Co.; A. F. WILSON, of Standard Oil Co., and W. A. WERTS, of Hall-Baker Co., were members of a round-table discussing practical production problems at the January monthly meeting of the Los Angeles Basin chapter of the A.P.I.

HIRST B. SUFFIELD has been appointed manager of the Sawyer Drilling Co., which recently opened offices in Houston, Tex.

JOE HOARD, of the Hoard Exploration Co., Houston, Tex., has returned from an extensive vacation tour of Mexico.

A. F. HOLLIDAY, general manager of the Benedum & Trees Oil Co., at Pittsburgh, Pa., was a business visitor to Corpus Christi, Tex., the past week.

DAN J. HARRISON, president of the Harrison Oil Co., Houston, Tex., has been appointed to the Texas University board of regents for a 6-year term by Gov. W. Lee O'Daniel.

ROBERT G. CARR, San Angelo, Tex., oil operator, has been elected president of the San Angelo Board of City Development for the coming year.

D. A. DECHMAN has been appointed production manager of the Cities Service Oil Co., which recently transferred its district office from Fort Worth to Houston, Tex.

J. S. ABERCROMBIE, president; ELWOOD FOUTS, vice president, and W. M. GASTON, chief clerk, Abercrombie Oil Co., Houston, Tex., have organized the Old Ocean Pipe Line Co., with offices at Houston.

EDGAR B. DAVIS, oil pioneer of Southwest Texas and former rubber-company executive, addressed the South Texas Geological Society's luncheon meeting at San Antonio, Tex., January 13. He spoke on rubber and the petroleum industry.

J. H. McEACHERN, manager of the marine department of Standard Oil Co., was in southern California last week inspecting the company's newest tanker, M. E. Lombardi, which arrived at Los Angeles Harbor from the Sun Shipbuilding yard at Chester, Pa. He has since returned to his office in San Francisco.

Oil scout "czars" for the four leading districts in Kansas and Oklahoma have been designated by the Chief Scouts Association of Tulsa. CHARLES WELLS, Carter Oil Co., is the czar for the Wichita, Kans., district; ROY DUNLAP, Sun Oil Co., Enid, Okla., district; JACK LANDER, Pure Oil Co., Shawnee, Okla., district, and M. J. MIZIE, Gulf Oil Corp., Ardmore, Okla., district.

FRANK L. HERLE and JOEL H. HIRSCH, formerly with the De Florez Engineering Co., New York City, have formed a consulting engineering partnership under the name of Herle & Hirsch, with offices in Wichita, Kans.

C. A. PRICHARD has become associated with Anderson-Prichard Oil Co., Oklahoma City, Okla. His present duties will be department manager in charge of purchases and stores for the combined Anderson-Prichard and Col-Tex organization. C. A. Prichard is a younger brother of L. H. PRICHARD, president of the corporation. He is a native of Mississippi. His son, NEAL PRICHARD, is superintendent of the Col-Tex refinery, at Colorado City, Tex.

J. E. MOORHEAD, executive secretary of the Pennsylvania Grade Crude Oil Association, has been elected vice chairman of the Associated Petroleum Industries of Pennsylvania. The post is a new one, created at the annual meeting held in Philadelphia. SAM MESSER, vice president, Quaker State Oil Refining Corp., was reelected chairman. E. F. COLLINS, Standard Oil Co. (Pennsylvania), was elected to the executive committee.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

Completion of a 500-bbl. well in the Electra field, Wichita County, Texas, and a 5-cent advance in Oklahoma and Kansas crude prices caused forecasts of a pickup in drilling.

Harry F. Sinclair and P. J. White sold Oklahoma properties, including about 8,000 bbl. daily production in Cushing, for $4,000,000 to $5,000,000.

The high rate of gas production in the Mexia-Grosbeck field in Texas deplored.

Gulf Coast Oil Producers Association formed to combat evils of short-term crude contracts. W. S. Farish elected president.

20 YEARS AGO

Contractors had virtually finished construction on Standard Oil Co. of Ohio's Toledo refinery representing an investment of more than $2,000,000.

A bill introduced in Congress proposes an embargo on exportation of United States oil. Discretionary powers to declare the embargo would rest with the president.

Oil operators from all Mid-Continent oil states converge on El Dorado, Ark., and boost prices of leases to peaks of $200 per acre near the discovery well.

Standard-Franco American Oil Co. organized as subsidiary of Standard Oil Co. (New Jersey) in France.

10 YEARS AGO

Governors of oil states launch series of meetings in Washington. Drive launched for partial embargo on oil imports.

Sir John Cadman, chairman of Anglo-Persian Oil Co., flies to Bagdad to complete negotiations for 1,000-mile pipe line from Iraq to eastern Mediterranean ports.

First unofficial proration hearing on East Texas held at Tyler.

North Texas crude price cut to 79 cents for 40° oil.

J. K. BERETTA, oil operator, San Antonio, Tex., has been made executive director of the National Bank of Commerce, San Antonio.

JOHN E. SHATFORD, former Arkansas refiner, has become associated with Pure Oil Co., Tulsa, as economic adviser.

ARTHUR E. JOHNSON, president, Argo Oil Corp., was recently elected a director of the United States National Bank, Denver, Colo. He is on his way to Honolulu on a vacation.

JAMES N. FRANCIS, formerly chief chemist of Bradford Oil Refining Co., has joined the chemical staff of the Louisville Refining Co., Louisville, Ky.

CLIFTON C. CROSS, Calgary, Alta., Canada, has been elected president of British Dominion Oil & Development Corp., with FRED L. WEHRHAN, L. H. FENERTY and HARDIE TURNBULL as directors.

BILL BAKER, formerly clerk in the Gulf Oil Co.'s offices in Amarillo, Tex., will become the company's scout for the Panhandle district, filling in for SCOUT JACK SIGMAN, who was called into military training the past week.

WILLIAM J. ARMSTRONG, chief conservation officer for the Oil and Gas Division of the Oklahoma Corporation Commission since 1924, moved up to a place on the commission January 13 as a result of his election in November, to succeed COMMISSIONER A. S. J. SHAW. Mr. Armstrong will continue in the role of conservation officer as well as a member of the commission.

COLIS CHANDLER is now land man and scout for the Deep Rock Oil Corp. in the Illinois-Indiana district, and has his offices at Evansville, Ind.

RUSSELL A. STAMPER, Skelly Oil Co., has been elected president of the Tulsa Roundup Club, popularly known as the "Goodwill Ambassadors of Tulsa," for a third consecutive term.

C. A. McADAMS, with Sinclair Prairie Oil Co., has been transferred from Amarillo, Tex., to Midland, Tex., where he will become district scout for the West Texas, New Mexico and Arizona area.

R. E. ALLISON, independent operator of Shreveport, La., has been elected to the board of directors of the First National Bank of Shreveport. Mr. Allison is a member and director of the Mid-Continent Oil and Gas Association.

Announcement has been made of the marriage of ARTHUR E. PEW, vice president of the Sun Oil Co., and MRS. JULIA FORD CUNNINGHAM, of New York, which took place November 22 at the Colorado ranch of Mrs. Pew's mother.

PAUL WEAVER, chief geophysicist for the Gulf Oil Corp., Houston, Tex., delivered a paper on "The Present Evidence on the Source of Salt in the Gulf Coast Plains" before the monthly meeting of the South Texas Geological Society at San Antonio, Tex., last week.

H. S. MOSS, independent operator of Dallas, Tex., has been elected the new president for 1941 of the Dallas Petroleum Club. Other officers elected were L. S. SINCLAIR, vice president of Magnolia Petroleum Co., as vice president; C. A. LESTER, secretary-treasurer; and EUGENE McDERMOTT, E. L. WILSON and W. E. BUTLER, new directors of the club.

Comes Easy for Him

H. W. Harts, newly elected vice president of the Warren Petroleum Corp., Tulsa, in charge of manufacturing, is one of those busy men who can always take on another duty.

H. W. HARTS

Helping to build and operate gasoline plants during the past 20 years, he has been faced with every major technical problem of this young industry. As head of Warren's manufacturing department he must now administer to gasoline plants in Oklahoma, New Mexico, Kansas, Texas, and Illinois. And, when there is any engineering work to be done at either the Port Arthur or Houston, Tex., Norsworthy or Lake Charles, La., terminals his advice is sought.

So Bill Harts has plenty to watch but he never leaves the impression that he is rushed. He always is on top of his job. Maybe that is because he has an engineering background. He was trained to hard work and changing economic conditions.

His earliest technical studies were in the University of Chicago. Then he attended the University of Illinois, from which he graduated in 1921. The oil business looked interesting and he immediately joined a construction crew of the Amerada Petroleum Corp. In 1925 he was appointed that company's construction superintendent and remained in this work for 10 years.

In October 1935, when Warren purchased the Amerada gasoline plants he accepted transfer as assistant general manager of the Natural Gasoline Corp., a Warren manufacturing subsidiary. Later, as his experience and energies asserted themselves, Bill was brought to the head of the manufacturing department.

JOE GOODSON, former scout for Gulf Oil Corp., has joined the C. L. Maguire organization, and left Grand Rapids, Mich., for Indiana last week on his first assignment.

DR. GUSTAV EGLOFF, director of research for Universal Oil Products Co., Chicago, addressed the Dayton, Ohio, section of the American Chemical Society, January 16, on "Oil in the National Defense."

MAURIE WALTERS is general superintendent of Sohio Pipe Line Co., operating the old Michigan-Toledo line. He adds the new duties to his position as general superintendent of the Sohio Corp.

WALDO SHELDON, general manager of the Socony-Vacuum Oil Co., Inc., accompanied by Mrs. Sheldon, and WARREN SMITH, vice president of the Pantepec Oil Co., sailed on the Grace liner Santa Paula for Venezuela Friday.

J. W. LIDDELL has been appointed manager, railway sales division, Continental Oil Co., with headquarters in Chicago. This is a new division which is the result of separating railway sales and traffic. P. H. KUHNS will continue as traffic manager.

FRED FUNK, geologist for Ohio Oil Co., and formerly at the Casper, Wyo., office, has been transferred to the company headquarters office at Findlay, Ohio. He is being succeeded at Casper by C. J. HARES, who is returning to the Rocky Mountain division from Marshall, Ill.

NORTHROP CLAREY, assistant to the president, Standard Oil Co. of New Jersey, and FRANK W. LOVEJOY, sales executive, Socony-Vacuum Oil Co., Inc., represented the oil industry on the discussion panels of the public-relations forum conducted by the American Council on Public Relations at the Harvard Club in New York City last week.

LEE A. ADAMS, Sinclair Prairie Oil Co. scout, with headquarters in Ardmore, Okla., has been assigned the west half of Oklahoma. DICK SMITH, with headquarters at Shawnee, Okla., has been assigned the east half of the state. C. T. WATSON, who formerly had his headquarters at Enid, Okla., has been transferred to Casper, Wyo., to scout the Dakotas.

Shifts: N. C. MORTIMER, superintendent, Phillips Petroleum Co., from Chase, Kans., to Great Bend, Kans.; E. D. WATSON, engineer, Shell Pipe Line Co., from Douglas, Tex., to Nacogdoches, Tex.; H. E. TREICHLER, JR., engineer, Texas Co., from Orange, Tex., to El Campo, Tex.; LOUIS O. STORM, engineer, Shell Oil Co., Inc., from Orange, Tex., to Iowa, La.; D. L. SCOTT, geologist, Gulf Research & Development Corp., from Eunice, La., to New Orleans, La.; C. L. WHITEMAN, engineer, Texas Co., from Waynesburg, Pa., to Auburn, Ind.; T. D. WALKLEY, superintendent, Oklahoma Pipe Line Co., from Tulsa to Harlingen, Tex.; A. B. HAMIL, superintendent, Petty Geophysical Engineering Co., from Cucuta, Colombia, South America, to Houston, Tex.

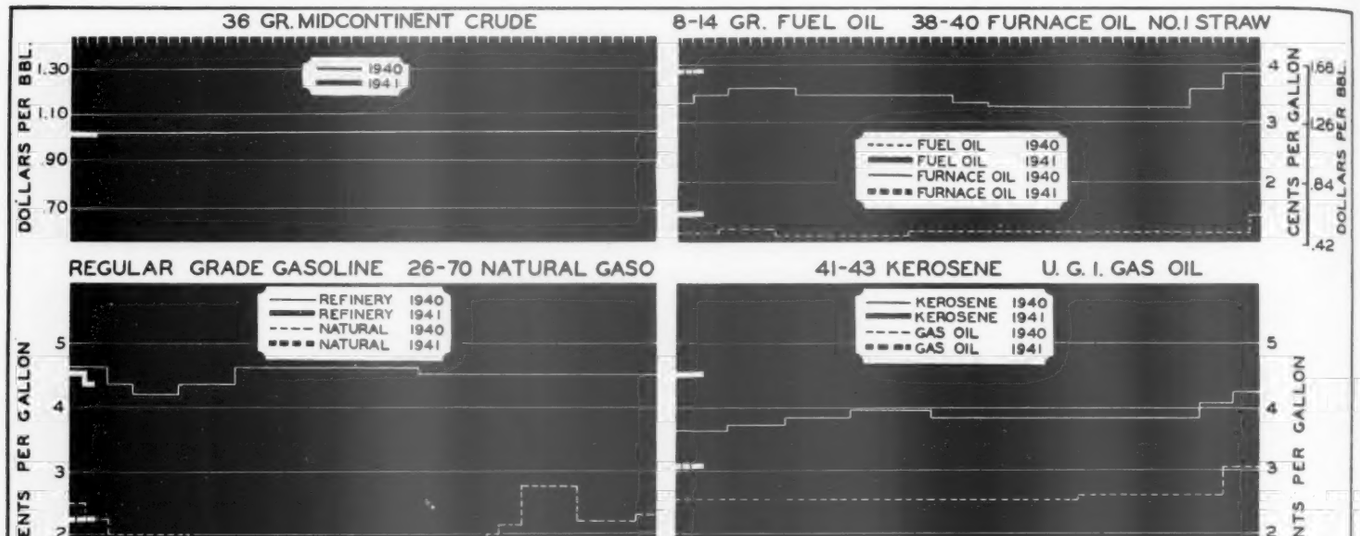
NELSON A. ROCKEFELLER, director of Creole Petroleum Corp., submitted his first report as coordinator of commercial and cultural relations between the American republics. He found that Latin-American offices of the United States were saturated with anti-American personnel; that anti-American propaganda was more vicious than pro-Nazi. Corrective steps are being taken, he reported, by many firms not previously acquainted with conditions.

LEWIS W. MacNAUGHTON, of DeGolyer and MacNaughton, was named president of the Dallas Petroleum Geologists for 1941 at the group's monthly luncheon. He succeeds W. W. CLAWSON, of Magnolia Petroleum Co. JAMES A. LEWIS, of Core Laboratories, Inc., was named vice president, FRED JOEKEL, of Magnolia, was elected secretary-treasurer, and HENRY C. CORTES, also of Magnolia, was made a member of the executive committee.

J. HOWARD PEW, president of the Sun Oil Co., has sold his 130-ft. yacht "'Egeria," to the War Department. The yacht, purchased for $72,500, will be used to transport soldiers between Fort Slocum and New Rochelle, N. Y.

ILIFF SPENCER HIGGINBOTHAM, in the land department of the Deep Rock Oil Corp., Tulsa, and a captain in the field artillery, U. S. Reserve Corps, has received instructions to report at Fort Sill for active duty on January 23.

W. G. BROWN, of Paroline, and KLARENCE KRONE, of Petrol Corp., have been added to the organizing and executive committee of the Lubricating Oil Manufacturers and Marketers Association, Los Angeles, Calif., which was recently organized to petition the state legislature to strengthen the marketing code with respect to lubricating oil. Other members of the committee include JACK FELDMAN, of Golden Bear Oil Co.; CLARENCE HASEROT, of Pennant Oil & Grease Co., and A. A. LIEBERMAN, of Petroleum Marketing Co.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Mid-Continent Refiners Reduce Price On Spot-Market Gasoline Shipments

By H. STANLEY NORMAN

INLAND refiners "dug in" this week for another stand against the market-depressing influences of recycling-plant condensates and off-specification gasoline. Marketing lines are being reformed after yielding ⅛ cent on the tank-car price of all grades of motor fuel when the competitive struggle against recycle condensate could not be maintained longer.

There has been no change in the movement of motor fuel from the Group 3 territory that would justify reduction of the tank-car price. Still there were numerous customers in the North Central states threatening to curtail or switch their source of supply over the next few months to condensate producers. In order to hold the business of northern customers and participate in new contracts some Group 3 refiners receeded from their price stand that had prevailed for about 5 months.

Spot Volume Satisfactory

The volume of spot-market business in gasoline is reported satisfactory by most refiners. Some refiners are disregarding the competitive-price situation and are supporting their higher-price position by quality of products and services. Business based strictly on price is being permitted to drift elsewhere by those displaying resistance to the market shift.

Low of the Group 3 market for regular gasoline dropped to 4⅜ cents January 15 and 16, compared to 4½ cents which had existed since the early part of August. Inferior-quality gasoline was offered by several Mid-Continent refiners at 3⅝ cents per gallon. The offerings on the low side of the market were in sufficient volume to set the spot price.

Despite the slump in tank-car prices the gasoline-consumption curve appears to be holding its gain above last January. Reports on consumption are preliminary but are sufficiently representative to support the prediction of an increase for the month. Colder weather and snow reduced automobile traffic this week but this change will not be reflected back in tank-car markets for at least 10 days. Relief of the pressure on Gulf Coast markets indicated 2 weeks ago by the appearance of several cargo inquiries had not developed to the extent predicted. One of the gasoline cargoes covered by inquiry was supplied by a major company which negotiated a trade for crude oil. The cargo of motor fuel moved in export. Reports of the transaction did not cover the details beyond the announcement that the inquiry had been withdrawn from the open market.

Refined Oil Market Barometer

Slump of the tank-car price on Mid-Continent gasoline appears not to have effected permanent relief from competition with recycling distillate material offered from Texas and Louisiana sources at figures only slightly above crude-oil costs. There has been no serious complaint over the volume of motor-fuel movement from Group 3 refiners as a whole throughout the winter.

MID-CONTINENT: Demand for fuel oils for northern shipment holding steady.

GULF COAST: Withdrawal of a few cargo inquiries caused earlier weakness to reappear.

CALIFORNIA: Fuel-oil prices and demand firm. Gasoline drifting aimlessly.

PENNSYLVANIA: Bright stocks in better demand at higher prices.

CHICAGO: Tank-car prices for gasoline retreat ⅛ cent. Fuels firm.

All grades of fuel oil, particularly kerosene and distillates, were in strong demand this week at steady prices. Suppliers were asking premiums at some points enjoying favorable freight rates to the large consuming centers. Buyers are resisting premiums or higher prices for fuel oil only to a limited extent.

Demand is particularly active for heavy fuels at current prices. Most suppliers are limiting shipments even to contract customers and several are unable to quote on spot business regardless of prices offered. Satisfactory fuels meeting No. 5 specifications are especially difficult to locate. Most refiners are currently operating their plants in such a manner that the medium-heavy fuels are bulked with bunker types and sold under that classification.

Distillate Stocks Abundant

Kerosene, range oil and No. 2 fuels are well established at firm prices. Supplies in the Mid-Continent are sufficient to supply current demand but there is no distress material in evidence. Demand from northern customers has improved slightly during the past few days, which is a natural result of colder weather in that part of the country. Comparatively mild temperatures earlier this winter, coupled with the highest distillate-stock position in history, have prevented the industry from working prices more than ¼ cent above the summer levels.

The natural-gasoline market relapsed into routine again this week after a temporary spurt based on the prospect of new business on the Gulf Coast. Failure of some of the cargo inquiries to culminate in sales prevented the expected bulge. There is no particular weakness in natural gasoline. Prices are steady at 2⅜ cents in Oklahoma and 2 cents in Texas for interstate business.

Distillate Fuel-Oil Prices Slump On Eastern Seaboard Market

By J. P. O'DONNELL

NEW YORK, Jan. 21.—Weakness that became apparent in the East Coast light-fuel-oil market a week earlier with a reduction in coastwise tanker rates has resulted in the winter's first reduction in prices. Socony-Vacuum Oil Co., Inc., announced that it had reduced prices of both No. 2 fuel oil and kerosene 0.2 cent in the New York Harbor area, kerosene 0.3 cent, and No. 2 fuel oil 0.2 cent at its Long Island City terminal.

As a result of these reductions, No. 2 fuel oil is now quoted at 4.7 to 4.9 cents per gallon and kerosene at 5.3 to 5.5 cents per gallon in the New York Harbor area. This is the first reduction in these prices since the normal upward trend began last fall. Whether or not it will be rescinded depends on demand and transportation rates. Prospects of more severe cold weather indicate that consumption will at least continue at the high levels that marked the greater part of last week.

The decline in coastwise tanker rates, inaugurated 2 weeks ago with a 15-cent reduction, was extended last week with the reported chartering of a vessel for mid-February loading at 50 cents per barrel for gasoline, 52 cents for kerosene and 55 cents for No. 2 fuel oil. These prices are declines of 20 cents, 23 cents and 25 cents, respectively, from the highs that were reached early last month. A slowing down in the demand for tankers is reported accountable for the reduced quotations.

Lower demand for tankers is attributed to the currently high level of light fuel-oil stocks on the East Coast. The increase in readily available stocks this year against the corresponding date of a year ago is approximately 75 per cent. Higher tanker rates are not expected until more substantial liquidation in East Coast inventories occurs.

In addition to reducing tank-car and barge quotations, Socony-Vacuum also announced that effective January 21, it would reduce tank-wagon prices through its metropolitan area. This area includes Manhattan Island, Long Island, Westchester County and Connecticut as far east as Stamford. Tank-wagon price reductions will be 0.2 cent for No. 2 fuel oil and 0.3 cent for kerosene.

In contrast to the downward revision of fuel-oil and kerosene prices, Pennsylvania bright stock was reported up 0.5 cent at inland refineries. The increase was attributed partly to recently higher quotations for steam-refined stock and also to a comparatively strong export demand. The export quotation on Pennsylvania bright stock, 25 pour, is still reported at 21 cents but the additional quantities said to be moving into export channels may bring an improvement. This was the first change in Pennsylvania bright-stock prices for almost 6 months.

Lubricating-oil exports have been on the increase in recent months with the bulk of the demand originating in Japan. Japanese purchases of lubricating oils in this country during 1940 were reported approximately 40 per cent greater than in the previous year with the bulk of the demand coming in recent months. The loss of German, Belgian, Italian and French markets was especially damaging to lubricating-oil manufacturers despite the increased buying of Japan and the United Kingdom.

The position of motor fuel in the East Coast area, strengthened considerably recently by exceptional contraseasonal demand, has weakened with the return of bad weather. Consumption declines are generally reported and while the prices of 72-octane material remain at from 5.5 to 5.7 cents in the New York Harbor the strength that was previously apparent has been dissipated. The combination of reduced demand and the continued unsettled retail conditions has affected the market adversely but the current prices, comparatively low, are not expected to be reduced further in the immediate future.

Bunker C fuel oil is in good demand though the same influences that affected light fuel-oil prices may affect heavier fuels similarly. There were a few reports of some price shading in heavy fuel oil sold in small quantities but they were apparently insufficient to affect the market.

The fuel-oil market, in addition to being affected by the substantially higher stocks this season, is also feeling the effect of greatly increased imports. Imports of gas oil, diesel fuel and distillate fuel oil have been markedly increased. During all of 1939, for example, imports of these products for immediate consumption totaled only 185,589 bbl. whereas in the first 11 months of 1940 this total was up to 2,962,221 bbl., the bulk of which was imported from Mexico. Imports for immediate consumption have been particularly heavy during the past fall, those from Mexico alone totaling 300,785 and 373,469 bbl., respectively, for October and November.

Imports of residual fuel oil likewise increased sharply. During the first 11 months of 1940 they were 26,514,596 bbl. against 16,143,607 bbl. in the corresponding 1939 period. Imports from Venezuela during the past year totaled 8,979,199 bbl. in contrast to none in the previous year. Imports from Venezuela alone in November were 2,031,096 bbl. for immediate consumption and an additional 28,369 bbl. were withdrawn from bond for consumption.

Buying Wave on Gulf Coast Lacks Sustaining Momentum

HOUSTON, Tex., Jan. 20.—The spurt in gasoline buying which featured the Gulf Coast refinery market a week ago ended about as abruptly as it began, and the past week the market again was quiet with no additional sales being reported. Under the influence of the buying spree, however, the market prices continued firm with tendency toward further stiffening, due to the prospects for possible additional demand soon to start, and to the relief given by the removal of material and generally more favorable outlook for Gulf Coast refiners. It has been reported that upwards of a dozen cargoes of gasoline, mostly motor fuel, have been moved as a result of the recent buying. Although most of this was for coastwise destination, several cargoes moved to England, it was reported.

The colder weather in the northern and eastern states gave some encouragement to Gulf Coast refiners that an increase in demand for burning oils might be expected. Several suppliers, particularly those in the immediate Houston area, have stiffened in their quotations as a result, and are holding out for the market top of 3½ cents as against 3¼ cents for which they were willing to sell a week ago. This stiffening, however, was unsupported by any sales, and most sellers continued to quote at lower figures. Corpus Christi refiners still have plenty of material at their old figure of 3⅛ cents. New Orleans refiners are quoting 3¼ cents. Several buyers reported that some sources of supply were pressing to move material and that this material could be obtained as low as 3 cents, they thought.

Residual fuels of Bunker C speci-

(Continued on Page 99)

A.P.I. Weekly Refinery Statistics

Week Ended January 18, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	18,228,000	10,106,000	14,837,000	516,000
Appalachian	91.0	3,145,000	380,000	478,000	133,000
Ind., Ill., and Ky.	90.2	15,896,000	3,001,000	3,975,000	531,000
Okla., Kans., and Mo.	76.9	7,210,000	1,994,000	1,332,000	270,000
Inland Texas	59.6	1,918,000	1,563,000	470,000	125,000
Texas Gulf	89.2	13,712,000	7,989,000	6,789,000	844,000
Louisiana Gulf	97.6	2,981,000	2,290,000	1,147,000	123,000
N. Louisiana and Ark.	51.5	548,000	454,000	330,000	51,000
Rocky Mountains	56.0	1,282,000	461,000	166,000	49,000
California	87.3	16,131,000	71,245,000	9,716,000	507,000
Total reported	86.2	81,051,000	99,483,000	39,240,000	3,149,000
Est. unreported	.....	6,300,000	1,730,000	680,000	341,000
*Est. total	.....	87,351,000	101,213,000	39,920,000	3,490,000
*Est. total previous wk.	.....	86,328,000	102,281,000	41,094,000	3,565,000
*Jan. 19, 1940	.....	87,574,000	103,905,000	29,505,000	3,510,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

BUREAU OF MINES ESTIMATE)

Week ended January 11, 1941	259,342,000 barrels
Week ended January 4, 1941	260,643,000 barrels
Week ended January 13, 1940	238,249,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of January 21, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Chicago, Ill.	14.6	12.6	4.5	10.0
Decatur	14.6	13.1	4.5	10.0
Joliet	15.6	14.1	4.5	10.0
Peoria	15.6	13.2	4.5	10.0
Quincy	15.4	13.9	4.5	9.8
Davenport, Ia.	15.6	14.1	4.5	‡10.0
Des Moines	15.4	13.9	4.5	‡9.8
Mason City	15.8	14.3	4.5	‡10.2
Duluth, Minn.	16.4	14.9	4.5	10.8
Mankato	16.0	14.5	4.5	9.5
Minneapolis	16.0	14.2	4.5	10.4
LaCrosse, Wis.	17.0	15.5	5.5	10.4
Green Bay	17.4	15.9	5.5	10.8
Milwaukee	16.8	15.3	5.5	10.2
Detroit, Mich.	14.1	12.6	4.5	8.1
Grand Rapids	14.3	12.8	4.5	9.1
Saginaw	14.9	13.4	4.5	9.1
Evansville, Ind.	16.6	15.1	5.5	†9.8
Indianapolis	16.8	14.8	5.5	†10.0
South Bend	16.8	15.3	5.5	†10.0
Fargo, N. D.	18.2	16.7	5.5	11.6
Huron, S. D.	17.5	16.0	5.5	10.9
Kans. City, Mo.*	14.9	11.9	4.5	8.6
St. Louis*	14.7	13.2	4.5	9.6
St. Joseph	14.9	13.0	4.5	8.4
Wichita, Kans.	13.8	12.3	4.5	7.2

***State tax 2 cents, 1-cent city tax, and 1½-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.**

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective Dec. 2, 1940, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 9.0 cents; 100-149 gal., 8.0 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-399 gal., 7.5 cents; 400 gal. and over, 7.0 cents. Stanolex fuel oil A, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex fuel oil B, 1-399 gal., 6.0 cents; 400-799 gal., 5.0 cents; 800 gal. and over, 4.75 cents. Stanolex Bunker C fuel oil, 1-999 gal., 4.75 cents; 1,000 gal. and over, 3.75 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Divided dir.	Incl. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

***Includes state tax of 1 cent.**

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
Atlantic City	11.00	12.60	4.5	8.1
Newark	11.00	12.60	4.5	8.1
Annapolis, Md.	12.85	14.35	5.5	9.5
Baltimore	12.25	13.75	5.5	8.75
Cumberland	13.65	15.15	5.5	10.0
Washington, D.C.	10.50	12.00	3.5	9.5
Danville, Va.	14.45	16.95	6.5	9.0
Norfolk	13.25	15.75	6.5	10.5
Petersburg	13.55	16.05	6.5	11.2
Richmond	13.55	16.05	6.5	11.0
Roanoke	14.75	17.25	6.5	11.0
Charles'n, W. Va.	14.05	16.55	6.5	12.6
Parkersburg	13.35	15.85	6.5	11.2
Wheeling	14.35	16.85	6.5	11.8
Charlotte, N. C.	16.40	15.00	7.5	10.55
Hickory	16.95	18.45	7.5	9.75
Mt. Airy	16.80	16.00	7.5	10.95
Raleigh	16.15	16.00	7.5	10.25
Salisbury	16.45	14.50	7.5	10.65
Charleston, S. C.	14.25	16.75	7.5	9.25
Columbia	15.10	17.60	7.5	(*)
Spartanburg	15.80	18.30	7.5	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

***Kerosene business of the company at these points now exclusively handled by dealers.**

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Net dir.	Incl. tax	Kero. tank wag.
Atlanta, Ga.	14.0	14.0	7.5	9.0
Augusta	15.5	15.5	7.5	9.5
Macon	15.0	15.0	7.5	9.0
Savannah	15.5	15.5	7.5	9.0
Birmingham, Ala.	16.5	16.5	8.5	9.0
Mobile	15.5	15.5	9.5	8.0
Montgomery	18.0	18.0	9.5	10.0
Jackson, Miss.	16.0	16.0	7.5	9.0
Vicksburg	15.5	15.5	7.5	8.5
Jacksonville, Fla.	16.0	16.0	8.5	8.0
Miami	16.0	16.0	8.5	8.0
Pensacola	17.0	17.0	9.5	8.0
Tampa	16.0	16.0	8.5	8.0
Lexington, Ky.	15.5	15.5	6.5	9.0
Covington	13.5	13.5	6.5	9.0
Louisville	15.0	15.0	6.5	8.5
Paducah	14.0	14.0	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
Philadelphia, Pa.	12.5	13.5	5.5	10.0
Pittsburgh	13.0	15.0	5.5	10.5
Allentown	13.0	14.5	5.5	10.5
Erie	12.5	15.0	5.5	10.0
*Scranton	13.0	14.5	5.5	10.5
Altoona	13.0	15.0	5.5	10.5
Dover, Del.	...	14.0	5.5	10.5
Wilmington	...	13.5	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck	Serv. sta.	Incl. tax	Kero. tank wag.
San Francisco	16.5	17.5	4.5	11.5
Los Angeles	16.0	17.0	4.5	10.0
Fresno, Calif.	17.5	18.5	4.5	12.5
Phoenix, Ariz.	20.5	21.5	6.5	*17.5
Reno, Nev.	19.5	20.5	5.5	13.5
Portland, Ore.	19.0	20.0	6.5	13.5
Seattle, Wash.	19.0	20.0	6.5	13.5
Spokane	20.5	21.5	6.5	16.5
Tacoma	19.0	20.0	6.5	13.5

***Includes 5-cent state tax.**

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons'r tank car	Dir.* tank wag.	Incl. tax	Kero. tank wag.
Albany	11.8	12.0	5.5	8.0
Met, New York	12.3	12.5	5.5	8.3
Buffalo	13.0	13.5	5.5	7.9
Rochester	12.8	13.8	5.5	8.5
Syracuse	12.5	10.7	5.5	8.9
Portland, Me.	11.4	12.9	5.5	8.4
Manchester, N.H.	12.9	12.1	5.5	9.2
Burlington, Vt.	11.6	11.8	5.5	8.6
Boston, Mass.	10.4	10.7	4.5	8.4
Worcester	11.0	11.5	4.5	8.0
Hartford, Conn.	11.3	11.5	4.5	7.9
New Haven	11.1	11.3	4.5	7.4
Providence, R. I.	10.4	11.5	4.5	8.4

***Undivided.**

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Denver, Colo.	14.5	5.5	10.5
Grand Junction	16.5	5.5	12.0
Pueblo	15.5	5.5	9.0
Casper, Wyo.	16.5	5.5	11.5
Cheyenne	12.0	5.5	11.0
Billings, Mont.	16.5	6.5	12.0
Butte	15.5	6.5	13.0
Great Falls	15.5	6.5	12.0
Helena	15.5	6.5	12.5
Salt Lake, Utah	16.0	5.5	14.0
Boise, Idaho	†18.6	6.5	16.0
Twin Falls	†19.6	6.5	16.5
Albu'que, N. M.	*16.0	7.0	9.5
Roswell	*14.0	7.0	8.0
Santa Fe	‡17.0	7.5	9.5

***Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.**

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank car	Dir. tank wag.	Incl. tax	Kero. tank wag.
New Orleans, La.	14.25	16.75	8.5	‡10.0
Baton Rouge	14.75	17.25	8.5	‡10.5
Alexandria	14.75	17.25	8.5	‡10.5
Lafayette	15.00	17.50	8.5	‡10.0
Lake Charles	14.75	17.25	8.5	‡10.0
Shreveport	14.00	16.50	8.5	10.0
Knoxville, Tenn.	18.00	20.00	8.5	12.5
Memphis	16.00	18.00	8.5	11.0
Chattanooga	17.50	17.35	8.5	12.0
Nashville	17.00	17.50	8.5	11.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Texarkana, Ark.	13.5	5.5	6.0
Fort Smith	13.5	5.5	6.5
Little Rock	16.0	8.0	8.0
Muskogee, Okla.	13.5	5.5	7.0
Oklahoma City	12.5	5.5	6.5
Tulsa	12.5	5.5	6.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Omaha	17.4	15.9	6.5	9.5
McCook	17.0	13.9	6.5	9.5
Norfolk	17.5	15.4	6.5	9.9
North Platte	17.8	15.5	6.5	10.3
Scottsbluff	17.4	14.5	6.5	10.3

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Dir.	Incl. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

***Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.**

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline

IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Incl. tax	Kero. tank wag.
Halifax, N. S.	24.5	10.0	18.0
St. John, N. B.	24.5	10.0	18.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	24.5	8.0	17.0
Hamilton, Ont.	24.5	8.0	17.0
Winnipeg, Man.	27.5	7.0	22.5
Brandon, Man.	28.0	7.0	22.5
Regina, Sask.	25.0	7.0	20.0
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.0
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	21.0	7.0	23.0

***Imperial gallon used in Canada.**

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In Maritime Provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. of Nebraska reduced the dealer tank-wagon price of regular gasoline at McCook, Neb., 0.5 cent per gallon January 9.

Standard Oil Co. of New Jersey advanced the tank-wagon price of No. 2 fuel oil 0.5 cent per gallon at Columbia, S. C., January 14.

Standard Oil Co. (Indiana) advanced the dealer and consumer tank-wagon price of regular gasoline 0.1 cent per gallon at Kansas City, Mo., January 14. The company also advanced the kerosene tank-wagon price 0.1 cent at Kansas City the same day.

Socony-Vacuum Oil Co., Inc., advanced the undivided dealer tank-wagon price on regular gasoline 1.1 cents per gallon January 14 at Portland, Me.

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of January 21, 1941

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:
72-74 octane (regular) .04⅝ .04½
63-66 octane .03⅞ .04⅛
60 octane and below .03⅝ .03¾
60-62 400 grades:
72-74 octane (regular) .04⅝ .04½
63-66 octane .04¼ .04¼
60 octane and below .03⅝ .03¾

NORTH TEXAS—

U. S. Motor grades:
72-74 octane (regular) .04⅝ .04½
63-66 octane .03⅞ .04⅛
60 octane and below .03⅝ .03¾
60-62 400 .03⅝ .03⅞

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:
72-74 octane (regular) .04⅝ .04½
63-66 octane .03⅞ .04⅛
60 octane and below .03¾ .03⅞

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:
72-74 octane (regular) .04⅝ .04½
60 octane and below .03⅝ .03¾

CHICAGO (Based on Group 3)—

U. S. Motor grades:
72-74 octane (regular) .04⅝ .04⅝
63-66 octane .04 .04⅛
60 octane and below .03⅝ .03¾
60-62 400 grades:
72-74 octane (regular) .04⅝ .04⅝
63-66 octane .04 .04¼
60 octane and below .03⅝ .04

PENNSYLVANIA (Inland refineries)—

74-76 octane (regular) .06
72-74 octane .05⅝

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher .05½ .07¼
54-58 U. S. Motor .04½ .06¼

EAST COAST (domestic)—

U. S. Motor grades:
New York (Bayonne)* 0.5½ .05¾
Philadelphia .05½ .07
Boston .05½ .06
Baltimore .05½ .06½
Charleston, S. C. .05¾ .06½

*All grades of gasoline ¼ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:
72-74 octane (leaded) .03¾ .03⅞
70-72 octane (unleaded) .03¾ .04
68-70 octane (unleaded) .03½ .03¾
Below 68 octane (unleaded) .03¼ .03½

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70 .02⅜
Grade 18-55 .02¾ .02⅞

NORTH TEXAS—

Grade 26-70 .02
Grade 18-55 .02⅜

CALIFORNIA—

75-85 375-390 .04½ .05¼

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70 .02

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p. .03½ .03⅝
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p. .03⅝ .03¾
46-48 gr., 210-230 l.b.p., 480-max., e.p. .03¾ .04

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44 .04¼ .04⅜
41-43 .04⅛ .04¼

NORTH TEXAS—

41-43 .04 .04⅛

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43 .04 .04⅛

ARKANSAS (Ark. and N. La. del.)—

41-43 .04 .04¼

PENNSYLVANIA (Inland refineries)—

46 .05½ .05⅝
45 .05½ .05¼

CHICAGO (Based on Group 3)—

42-44 .04¼ .04⅜
41-43 .04⅛ .04¼

CALIFORNIA (Pac. Coast market)—

38-43 high burning test .04½ .05½

NEW YORK (Bayonne, N. J.)—

41-43 .053 .055

GULF COAST (domestic)*—

41-43 .03½ .03⅝

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil .04 .04⅛
No. 1 prime white, 38-42 .03⅞ .04
No. 1 straw, 38-40 .03⅝ .04
No. 2 straw, 32-36 .03½ .03⅝
No. 3 zero to 10, 28-32 .03⅝ .03½

NORTH TEXAS—

No. 1 prime white, 38-42 .03¾ .03⅞
No. 1 straw, 38-40 .03⅝ .03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36 .03½ .03⅝

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36 .03½ .03⅝

CHICAGO (Based on Group 3)—

Range oil .04 .04⅛
No. 1 prime white, 38-42 .03⅞ .04
No. 2 straw, 32-36 .03½ .03⅝
No. 3 zero to 15, 28-32 .03⅝ .03⅝

NEW YORK (Bayonne, N. J.)—

*No. 1 .053 .055
*No. 2 .047 .049
*No. 4 .047 .049

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35 .03⅛ .03⅛
No. 5, low pour point, 18-22 .75 .80
No. 6, 15 and above, 8-14 .60 .65

NORTH TEXAS—

U.G.I. gas oil, under 35 .03 .03⅛
No. 5, low pour point, 18-22 .75 .80
No. 6, 15 and above, 8-14 .60 .65

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial .70

CHICAGO (Based on Group 3)—

U.G.I. gas oil .03⅛ .03¼
No. 5, low pour point, 18-22 .75 .80
No. 5, 15 and above, 18-22 .60 .70
No. 6, low pour point, 10-16 .60 .70
No. 6, 15 and above, 8-14 .60 .65

PENNSYLVANIA (Inland refineries)—

36-40 .04½ .05

CALIFORNIA—

Los Angeles:
30-40 gas oil, per bbl. 1.10 1.25
24 plus diesel, per bbl. 1.10 1.25
24 plus diesel (bunkers) 1.20 1.35
12-16 (bunkers at tidewater) .65 .75
10-16 (cargo lots) .65 .75
12-17 (tank cars) .60 .75
10-17 (high sulfur) .50 .65
San Joaquin Valley:
10-18 (tank cars) .55 .70
24 plus diesel, per bbl. 1.10 1.25
San Francisco:
24 plus diesel, per bbl. 1.35 1.40
24 plus diesel (bunkers) 1.40 1.50
10-16 (bunkers) .75 .90

GULF COAST—

No. 2 fuel .03¼ .03¼
43-47 diesel .03¼ .03¼
48-52 diesel .03½ .03⅝
53-57 diesel .03½ .03⅞
48-and-above diesel .03⅝ .03¾
Diesel bunkers 1.50
Bunker C (bulk cargoes) .75 .80
Bunker C (bunkers) .80

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil .05
28-30 diesel (lighterage 6¼c per bbl.) 2.00
28-30 diesel (tank cars) .047 .049
Bunker C (to ocean-going ships in N. Y. Harbor 1.25
Industrial fuel (tank cars) .046

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D. 10-25 .18
150-160 D. 0-10 .13½
150-160 D. 10-25 .13
100-110 D. 0-10 .13
100-110 D. 10-25 .12½
Steam refined:
600 dark green (untreated) .07

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):
10 pour point .15 .15½
15 pour point .14 .14½
25 pour point .13 .14
Steam refined:
600 .08
650 .08 .08½
600 flash .09 .09½
630 flash .11 .12

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:
150-3 .08
180-3 .08½
200-3 .08⅝
250-3 .10
280-3 .10⅛
280-4 .10
300-3½ .11
350-3½ .11½
400-3½ .12
500-3½ .12½
600-3½ .13
100-2½ paraffin oil, 10-25 .05¼
10-25 pour point:
200-3 .08
250-3 .09½
280-3 .10
280-4 .09½

GULF COAST—

Pale oils:
100-3 .05¼ .05¼
200-3 .07⅛ .07⅛
300-3 .07½ .07⅝
500-3½ .08¼ .08⅜
750-3½ .08⅝ .08¾
1,200-3½ .08¾ .08⅞
2,000-4 .09
3,000-4 .10½
Red oils:
200-5-6 .06⅞ .07
300-5-6 .07¼ .07½
500-5-6 .08 .08¼
750 .08¾ .08½
1,200-5-6 .08½ .08⅝

CALIFORNIA (moving to dom. market)

Pale oils:
100-2½-3 .07¼ .08
200-2½-3 .07¼ .08
300-2½-3 .07¼ .08
400-3-4 .07½ .08
450-3-4 .07¼ .08
550-3-4 .09 .11
600-3-4 .09 .11
Red oils:
200-4-5 .07¼ .08
300-5-6 .07¼ .08
350-5-6 .09¼ .11½
400-5-6 .09¼ .11½
450-5-6 .09¼ .11½
500-5-6 .09¼ .11½
600-5-6½ .09¼ .11½
700-6½ plus .09¼ .11½
750-6½ plus .09¼ .11½
900-6½ plus .09¼ .11½

PENNSYLVANIA—

150 vis., at 70° F., 3 color, 400-405 flash:
Zero pour point .22½
10 pour point .21½
15 pour point .20½
25 pour point .19
200 vis., at 70° F., 3 color:
Zero pour point .24½
10 pour point .23½
15 pour point .22½
25 pour point .21

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale .02½ .02¾

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale .02¾
124-126 (A.m.p.) w.c. scale .02¾

NEW YORK—

Wax in bags fully refined:
125-127 (A.m.p.) wax .0560
128-130 (A.m.p.) wax .0560 .0570
130-132 (A.m.p.) wax .0585
133-135 (A.m.p.) wax .0615
135-137 (A.m.p.) wax .0640
Crude scale:
124-126 (A.m.p.) w.s. .02¾
124-126 (A.m.p.) y.s. .02¾
Petrolatum in barrels, carload lots:
Dark green .02125 .02625
Amber .02375 .02875
Extra amber .02625 .03000
Lily white .04375 .05125
Snow white .05125 .06000
Cream .03375 .04125

Export Prices

GASOLINE

GULF COAST—

U. S. Motor .03¼
60-62 400 .03¼ .04
61-63 390 .03¼ .04½
64-66 375 .03¼ .04¾

LOS ANGELES—

U. S. Motor grades:
Above 69 octane .05½ .05⅝
65-69 octane .05¼ .05½
60-65 octane .04½ .05

KEROSENE

GULF COAST—

41-43 water white .03⅝ .03¾

LOS ANGELES—

41-43 water white .05 .05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (i.a.s. in bbl.)—

Cylinder stocks:
600 S.R. unfiltered .16½
630 S.R. unfiltered .17
600 flash, S.R. .18
650 flash, S.R. .20
Bright stock:
Light, 25 pour point .20½

NEUTRAL OIL

200-3 color .27
150-3 color .25½

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p. .0560
125-127 A.m.p. .0560
128-130 A.m.p. .0585
133-135 A.m.p. .0615
135-137 A.m.p. .0640
Crude scale:
124-126 w.s. .02¾
124-126 y.s. .02¾

EQUIPMENT PROGRESS...

Maxim Announces Waste-Heat Boiler and Silencer

The Maxim Silencer Co. announces the development of a combination waste-heat boiler and silencer to provide efficient silencing and at the same time collect and use the waste heat normally lost in exhaust. The design of this new line of waste-heat boilers and water heaters is novel since no tubes whatever are used in its construction. Heat is recovered by a simple arrangement of angle irons which form a very efficient extended heating surface.

The device is constructed around the well-known Universal silencer principle originated by the company several years ago and therefore no additional silencing unit need be used. The boiler is also combined with an efficient spark arrestor when required, and occupies little more space than the usual muffler. Particular attention has been given the design to permit of its being operated dry over long periods without injury. A small boiler is being exhibited at the National Motor Boat Show, where it may be seen at the company's booth in Space 41.

HOMCO Acquires Fullgage Deflecting Tool Co.

Houston Oil Field Material Co. announces the purchase of Fullgage Deflecting Tool Co., effective January 1, 1941. The latter company for several years has been engaged in the manufacture of patented deflecting tools and has maintained an efficient controlled directional-drilling service organization which introduced full-gage deflection and bottom-hole orientation to the industry.

The HOMCO cutting and fishing tool division will retain the experienced directional-drilling engineers of the Fullgage company as a nucleus for a new and larger directional-drilling department. The deflecting tools will be manufactured in the new HOMCO plant on Wayside Drive in Houston, and will be available on a service basis similar to that of HOMCO cutting and fishing tools.

S.A.E. 4640 Now Carried In Stock by Ryerson

Users of S.A.E. 4640 steel will be interested to know that this very reliable gear steel is now carried in stock for immediate shipment by Joseph T. Ryerson & Son, Inc., Chicago. Stocks include hot rolled annealed rounds, in sizes from 1 to 5 in.

Because of its high fatigue resistance, toughness, and ability to attain a high degree of hardness with minimum of distortion in heat treatment, S.A.E. 4640 is one of the best gear steels of the medium carbon grades. It will develop high hardness and tensile strength with a relatively mild quench. This mild quenching operation, together with the stability and balance of the alloy itself, tends to produce less distortion in the finished part than when other steels of the same general type are used. It also shows higher impact resistance at high hardness than other 0.40 carbon-alloy steels in the same or slightly lower price range.

The machinability of both annealed and heat-treated S.A.E. 4640 is superior to other steels of this type. It can be satisfactorily machine finished at 400 Brinell. Nickel molybdenum steels of this type in the hardened condition will resist cracking under severe surface grinding better than many other alloy steels at equal hardness.

In addition to gear use, S.A.E. 4640 is recommended for arbors, racks, worms, boring bars, spindles, clutches, piston rods, bolts, studs, ratchets, pins, and other applications where resistance to shock and great toughness are necessary at relatively high hardnesses.

TRADE LITERATURE

DAYTON-DOWD CO., Quincy, Ill.—Bulletin 3300, a 4-page folder, describing its new Type PT and PXT turbine pumps for refinery and process pumping service. The single-stage pumps are available in capacities to 150 g.p.m., pressures to 250 lb., and temperatures to 850° F.

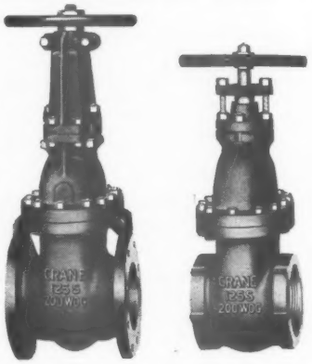
MONSANTO CHEMICAL CO., 1700 South Second Street, St. Louis, Mo.—48-page booklet, "Monsanto Chemicals of the Phosphate Division," describes the products of this division, tells their principal uses, the grades produced, and the containers used.

THE LINDE AIR PRODUCTS CO., 30 East Forty-second Street, New York.—"Oxy-Acetylene Tips," December issue featuring the fundamentals of flame hardening and "Bronze Rod to the Rescue." Other items include hard-facing of ripper teeth, practical ideas for construction of shop accessories, and operating instructions for the maintenance of regulators.

AIR REDUCTION SALES CO., 40 East Forty-second Street, New York.—8-page booklet featuring the No. 4 Radiagraph—a portable motor-driven gas cutting machine. The first four pages are devoted to a discussion of the general operation and construction features. This section points out how the machine is ideal for making straight-line cuts, for cutting arcs or complete circles, and for cutting irregular shapes involving long sweeping curves, either simple or compound. The second half is devoted to a description of flame hardening and plate-edge preparation operations which can be accomplished by using the Standard 4 Radiagraph with special easy-to-attach equipment.

Crane Announces New Line of Iron-Body Wedge Gate Valves

A new and complete line of standard iron-body wedge gate valves for 125 lb. steam, 200 lb. cold working pressure has just been brought out by Crane Co., Chicago, Ill. This new line includes both the brass trimmed and the all iron patterns with O. S. & Y., or nonrising stem, in sizes 2 to 12-in. inclusive. Also, the quick opening and the Underwriters' patterns, the alloy trimmed, alloy cast-iron valves for process work, and the standard iron-body valves for marine-cargo oil systems.



Among the important features of these new valves is the redistribution of body and bonnet materials, which eliminates all excess weight and yet complies with all standard requirements. Handwheels are of strong malleable iron; deep stuffing boxes permit a generous amount of packing; the body-bonnet joints employ a flat gasket closely bolted together so that gasket compression is evenly distributed; seat rings are of the shoulder type to retain tight contact with the body in spite of the difference in expansion characteristics; stems, threads, bolt holes, nuts and bolts, in fact, all machined parts, are precise in their fit and finish, which reflect the careful workmanship and high quality built into them.

This complete line is illustrated and described in detail in a new booklet (No. A.D 1452) which will be mailed on request. Address any Crane branch, or Crane headquarters at 836 S. Michigan Avenue, Chicago

SPECIAL FEATURES OF CARDWELL ROTARY DRILLING RIGS

Special features of Cardwell drilling rigs, manufactured by Cardwell Manufacturing Co., Wichita, Kans., have been outlined by the company as follows:

Air controls, except manually operated master transmission clutch and brakes. "Cardwell" five-speed, even-ratio gear transmission with reverse. High drive outside of transmission permits fast block return while transmission remains in any gear. No transmission shifting is necessary except as load increases or decreases. Rotary table operates directly from the transmission with five speeds and reverse, and through a friction-clutch drive with air brake.

The entire draw works with engines in place may be moved over highway without special permit. (It is necessary to remove some small parts.) When rotating, no drives are running except to the rotary table, although catheads or drum may be engaged without stopping rotary table or slush pump. Air brake on cathead shaft and drum drive. Air-operated automatic cathead. All wearing parts including brake flanges are heat-treated and of alloy steel. All sprockets are specially hardened. Friction clutch drives throughout are fully ball bearing. Rathole drive sprocket is built into the draw works. All engines are standard with fireproofing and water-circulated spark arrester. Main-drive chains run in spray of oil in oil-tight cases.

Two Westinghouse two-cylinder compressors are used. All air controls are through Westinghouse diaphragms and "Cardwell" special control valves. All air lines are housed in vibration-proof conduit. Dual safety braking system enables one brake to operate independently and hold the load if the other fails. Engines, when standard with variable speed governor, are equipped with automatic governor control whereby engines when on pump have reduced revolutions per minute for continuous duty and when on draw works have increased revolutions per minute for intermittent duty.

Lane-Wells Officials Meet for Annual Sales Convention

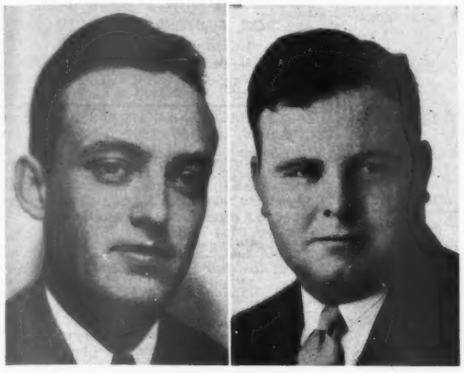
Plans for an aggressive sales campaign in 1941 were made when the officials of all Lane-Wells Co. divisions met in Los Angeles, Calif., January 13-17 for their annual sales convention.

Convention activities were directed by M. E. Montrose, vice president and general sales manager. Lane-Wells Gulf Coast division was represented by Morton T. Higgs, division manager and J. E. Huff, Jr., in charge of division sales. R. B. McCullar, division manager and Charles T. Casebeer, division sales manager, represented the Mid-Continent division. California representatives were J. W. McPhee, division manager, and D. M. Anderson, division sales manager. J. Murray Walker attended from Okotoks, Alta., Canada.

AMONG EQUIPMENT MEN...

Fluid Packed Pump Adds Two Mid-Continent Salesmen

O. L. Frame, southern Mid-Continent district manager for Fluid Packed Pump Co., Los Nietos, Calif., has announced appointment of R. E. Fuller and B. James Knight to the company's Mid-Continent sales force.



B. JAMES KNIGHT *R. E. FULLER*

Mr. Fuller joins Fluid Packed Pump Co. as salesman following 7½ years in the employ of Mid-Continent Supply Co. Mr. Fuller worked out of the Lake Charles, La., and Houston, Tex., offices of that firm. B. James Knight was at one time associated with W-K-M Co. He left after 2 years to join Schlumberger Well Surveying Corp., where he was employed until his recent appointment to Fluid Packed Pump Co.'s sales department.

Both Mr. Fuller and Mr. Knight will have their headquarters at the Mid-Continent branch, 2 Southeast Twenty-ninth Street, Oklahoma City, Okla.

BUSINESS NOTES

Caterpillar Tractor Co. has announced the appointment of L. C. Allenbrand as manager of the company's sales development division. He succeeds G. E. Spain, who has been promoted to general sales manager. Mr. Allenbrand came to Caterpillar Tractor Co. in 1931 as a special representative in the general sales department. Early in 1934 at the Peoria, Ill., factory he was made assistant manager of the sales training division. He has held that position until the present time and in that capacity Mr. Allenbrand organized the company's annual diesel show program.

M. P. Robinson, proprietor of the Robinson Filter Co. has joined Worthington Pump & Machinery Corp. to take charge of that corporation's newly organized water-purification equipment division. Prior to the establishment of his own water-purification company in 1937 Mr. Robinson had, for 17 years, been eastern representative of the International Filter Co. of Chicago. He is a licensed professional engineer under authority of the state of New Jersey.

Recognition of his quarter-century of service with Goodyear Tire & Rubber Co. at last year's end was the award made of a 25-year pin to Woodburn C. Winings, manager of the company's mechanical goods sales department since 1930. Joining the company in 1915 as a general line salesman at Indianapolis, his service was interrupted by the World War. Upon his return to Goodyear he was appointed mechanical goods sales representative at Chicago. Made manager of the Indianapolis branch in February 1926, in June 2 years later he was promoted to assistant manager of mechanical goods sales department in Akron, of which he was made manager in 1930.

D. S. Mix Now Responsible for G-E Media and Publishers Relations

The assignment of responsibility to D. S. Mix for media and publishers relations, General Electric publicity department, Schenectady, N. Y., has been announced by R. S. Peare, manager of G-E's publicity department and broadcasting. Under his new duties, Mr. Mix will have responsibility for the work formerly handled by the late F. R. Davis. Mr. Mix joined General Electric in 1917 and since 1932, he has devoted his time to publicity-department training programs, personnel, and special assignments, which he will continue to handle.

Frick-Reid Announces Several Sales Organization Changes

Frick-Reid Supply Co., Tulsa, has announced the following changes in its organization, to be effective on or about February 1, 1941:

H. H. Wilson, formerly sales manager of the company, at Tulsa, has been made a vice president of the company, with headquarters at Houston, Tex. Mr. Wilson entered the services of Frick-Reid in July 1920, at Tulsa, and was later, successively, located in branch stores and districts, and for a number of years was manager of the company's office at Dallas, Tex. He has been located at Tulsa as sales manager since June 1938.

H. H. WILSON

Rainey Elliott, formerly manager of the Dallas office, has been appointed sales manager. He entered the employ of Frick-Reid in January 1935. H. L. Wilkins, formerly general district sales manager, headquartered at Mount Vernon, Ill., has been appointed manager of branch stores. Mr. Wilkins entered the services of Frick-Reid in July 1919. Messrs. Elliott and Wilkins will hereafter be located at Tulsa.

F. J. Kopp, formerly district sales manager for the Texas Panhandle district, has been appointed manager of the Dallas and Fort Worth offices. Mr. Kopp entered the services of Frick-Reid in July 1917. The branch stores, formerly in the Texas Panhandle district, are now placed in the South Oklahoma-North Texas district, under H. D. Stanley, district sales manager, at Wichita Falls, Tex.

J. W. Kaye, formerly assistant district sales manager, Gulf Coast district, has been appointed district sales manager of a new district, the Southwest Texas district, with headquarters at San Antonio, Tex. Mr. Kaye has been in the employ of Frick-Reid since May 1925.

U. G. White, Jr., of Mount Vernon, Ill., has been appointed district sales manager, Illinois-Kentucky district. Mr. White entered the employ of Frick-Reid in March 1919.

R. R. Boyer, of Mount Pleasant, Mich., has been appointed district sales manager of the Michigan district. Mr. Boyer has been in the employ of Frick-Reid since September 1929.

Charles B. Jahnke Becomes Cooper-Bessemer President

Resignation of B. B. Williams as president of the Cooper-Bessemer Corp. and election of Charles B. Jahnke as his successor has been announced following a meeting of the corporation's board of directors in Mount Vernon, Ohio. Mr. Williams was made chairman of the board of directors, succeeding Dr. E. J. Fithian of Grove City, Pa., who resigned his position. The new chairman expects to continue in an active capacity as the head of the corporation. Mr. Jahnke will act as president and general manager and will serve as a member of the executive committee. Dr. Fithian, one of the founders of the Bessemer Gas Engine Co., will continue as a member of the board of directors.

B. B. WILLIAMS *C. B. JAHNKE*

The new president has been with Cooper-Bessemer since 1935, having served 2½ years as chief engineer and since July 1937, as vice president and general manager. Reared at Cincinnati, Mr. Jahnke was graduated from the University of Cincinnati in 1910 and then worked for 21 years with Fairbanks, Morse & Co. at Beloit, Wis., first as chief engineer and later as works manager of the Beloit plant. He later served as director of engineering after the Fairbanks-Morse management was changed to concentrate all activities of the company at Beloit. In 1931 he went to Chicago to join the International Harvester Co. in their program of developing diesel engines for farm machinery. Four years later he became affiliated with Cooper-Bessemer at Mount Vernon.

Mr. Williams, the retiring president, has been with Cooper-Bessemer Corp. and its predecessor, the C. & G. Cooper Co., for 40 years. In 1900 he joined the Cooper Co. as sales engineer, and was made secretary in 1912. Four years later he became vice president and general manager, and in 1920 was elected president, a position he retained when the Cooper company merged with Bessemer in 1929 to form the present corporation.

W. G. Green Elected President Of Tulsa Nomads Club

W. G. Green of the Engineering Laboratories, Inc., Tulsa, was elected president of the Tulsa Nomads Club at the annual meeting and dinner held Monday night, January 20. Mr. Green served the club as vice president last year and succeeds Fred E. Cooper of the Fred E. Cooper Co., who was active in the formation of the Tulsa organization in the fall of 1939 and became its first president.

Gerald H. Westby of Seismograph Service Corp. was elected vice president and Harold M. Cosgrove, secretary of the Tulsa Purchasing Agents Association, was re-elected secretary and treasurer. L. D. Baird of the Baird Manufacturing Co. and Fred E. Cooper were elected to the board of regents of the national organization representing the Tulsa chapter.

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212 Kellogg Building, Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

NEW MEXICO
STATE OIL AND GAS LEASES
Another block in a NEW HOT SPOT. This is a good bet. Buy direct and save those dollars. No middle man to pay; no salesmen to bother you. Better buy a little of something, than a whole lot of nothing.
HARRY S. WRIGHT
New Mexico State Lessee
Farmington, New Mexico

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W.P. HARLEY, Bowling Green, Kentucky.

NEW MEXICO
Oil and Gas Leases and Royalties
ROY G. BARTON, Hobbs, N. M.

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WHY drill dry holes? Our method only locates structures which contain oil or gas. Drawer 711, Brownsville, Texas.

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SALESMEN, BROKERS, Cheap Lands in fee with all mineral rights in well located counties where Major companies have large lease holdings. Write Box 754, Jackson, Mississippi.

WILL take $7500.00 cash for ½ interest in 3000 acres oil leases and drilling well, half completed, good geology, on West Texas Structure, six formations to 3250 ft. depth. Address Owner, 610 Wilson Building, Dallas, Texas.

FOR SALE
800 acres of land in the oil belt of Western Kentucky. One-half (1/16) of minerals reserved to owner. Good geology. Three shallow producing oil wells. No deep drilling. $10.00 an acre. Joel Bailey, 309 Grein Bldg., Evansville, Ind.

GEORGIA Charlton County 35,000 acres one ownership ten-year lease will give for well commencing July first or will sell outright 2½ cents per acre. Write KENNETH NIX, 343 Peachtree Street, Atlanta, Georgia.

Geophysical Service

THE Gravitational Selector, 14957 Lakewood Heights Boulevard, Lakewood, Ohio, offers to help make this your Lucky Year in producing Oil and Gas. Why not stop guessing? Use this scientific method to locate your structures and wells. Our last three predeterminations are making 120, 200 and 500 barrels respectively in a state where dry holes are the rule. Use our system and you will start the year right and end it a more prosperous man.

Business Opportunities

FOR SALE: Controlling interest approximately for hundred thousand in profitable oil production and gasoline plants. Opportunity. Box A-321, The Oil and Gas Journal, Tulsa, Okla.

WANT finances revolutionary principle new invented Mona Wing airplane operates with Diesel Engine, 1/5 cost present planes, cruising speed over 800 MPH. No nose dive, tail spin, side slip or stall, patents and wind tunnel test approved. Generous interest given. H. Freels, 251 S. Hill St., Los Angeles, Calif.

FOR SALE—Idaho Phosphate Property. Unusual investment opportunity in the world's largest phosphate field. Clear title to incorporated company and all its holdings. Write H. C. Petersen, Rt. 5, Omaha, Nebr.

Survey Service

REMEMBER EAST TEXAS
"When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2 first producer Wilmington, Calif., field, located by this method. Not theoretical prognostications. Approximate depths and thickness of sands given. I own production. Information to prospective operators, only. George Miller, 1548 Post, Torrance, California."

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CAPITAL SEEKERS
Put your project before 260 Key-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan

INQUIRIES SOLICITED from Capital Seekers with worthy projects. House with excellent facilities, moderate charges. BROWN HARTWELL COMPANY, 110 East 42nd Street, New York.

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Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Iquiries invited.

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Paul Brown Bldg., St. Louis, Mo.

WILL buy small or large producing oil royalty interests in Okla., Texas or New Mexico. Oscar L. Grimes, Tulsa Loan Bldg., Tulsa, Okla.

WE MAINTAIN A MARKET FOR REGISTERED DEALERS IN ALL FORMS OF OIL INVESTMENTS
FIRST DEPENDABLE OIL CORP.
522 Fifth Ave., New York, N. Y.

WILL purchase royalties, on land in Illinois. Must first be given right to test land with my method, which quickly eliminates non-mineral formation. This test is done without charge and free from any obligation on part of owner of land. Not interested in brokers offers. Address Box A-268, The Oil and Gas Journal, Room 1404, 105 W. Madison, Chicago, Illinois.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

For Sale—Equipment

FOR SALE: At Bartlesville, Oklahoma, 1—50 HP Kewanee locomotive type boiler with stack 150# WP. Will pass state inspection. $200.00. I. T. I. O., Bartlesville, Okla.

FOR SALE—$300 EACH
6 Good 12" x 12" Twin Steam drilling engines, Ideals—Luceys—Johnsons.
LUCEY PRODUCTS CORPORATION
Tulsa, Okla.

FOR SALE: At Oklahoma City 2—set slightly used 6½" Spang Weldless drilling jars 4½" stroke 3⅛"—4⅛" box and pin, $100.00 per set. I. T. I. O., Bartlesville, Okla.

TANKERS
DRY DOCK; wood, 10,000-ton D.W.T.
DREDGE: hydraulic, for approx. 18" to 24" section line.
TUGS & BARGES; ocean.
IRON & STEEL PRODUCTS, INC.
36 years' experience
13412 S. Brainard Ave., Chicago, Illinois
'Anything containing IRON or STEEL'

FOR SALE: Now erected in Oklahoma City field, 50—1500 barrel 2 ring flat seam 12 gauge used oil storage tanks, $175.00 each. I. T. I. O., Bartlesville, Okla.

FOR SALE—Gasoline Plant Equipment. Bessemer Engines & Compressors, large stock of pipe, pumps, tanks, meters, etc. Gilbert Pipe & Supply, Electra, Tex.

FOR SALE: Erected in Oklahoma City field, 15—500 Bbl. used BS&B VP bolted tanks, $75.00 each. I. T. I. O. Co., Bartlesville, Okla.

FOR SALE: Southern Oklahoma, five 450 HP Gas engines direct connected 36" compressors for boosting plant at sacrifice. Full information, write
EMCO EQUIPMENT CO.
1st Natl. Bldg., Oklahoma City, Okla.

FOR SALE: At our Oklahoma City warehouse slightly used Cardwell KS DHS skid type oil well servicing unit equipped with DHK Waukesha motor. I. T. I. O. Co., Bartlesville, Okla.

NOTICE — CABLE-TOOL CONTRACTORS. Save money; good used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

FOR SALE: At Oklahoma City—1 Brauer shale separator, steam operated. I. T. I. O. Company, Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: At Oklahoma City—1 Toledo electric power drive complete with 60 cycle single phase 110-volt A.C. motor. I. T. I. O. Company, Bartlesville, Oklahoma.

LANDIS Pipe machine head, capacity 4" to 8" oilfield length threads; 2 sets dies. Also 6" to 12" head standard length threads. Murray-Baker-Frederic, Inc., P.O. Box 1282, Shreveport, La.

FOR SALE: At Wynona, Oklahoma—1 Twin and 2 Single Cooper gas engine type "S" compressor units with double acting cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

TRACTORS
Caterpillars, crawler type, size "35" $375; size "65" with nigger head winch $750; Caterpillar RD8 with Letroneau bulldozer, $2060; and Allis-Chalmers, Model L with Baker bulldozer $1850. Perfect condition. O. C. Evans, Mount Sterling, Kentucky.

FOR SALE: 30 x 50 x 12 Iron Wood Frame Building, 20-hp. motor, line shaft, pulleys, belt, 3 x 7 I-beam, hand pipe tools, and roll top desk. Bargain price to clean up. A. D. Elliott, Depew, Okla.

FOR SALE: At Bartlesville 1—2A National Portable Drilling Machine Less Tools. I. T. I. O. Co., Bartlesville, Okla.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	*$1.05*	*$1.80*	*$2.55*	*$3.30*	*7 Lines*	*$2.45*	*$4.20*	*$5.95*	*$7.70*
4 Lines	*1.40*	*2.40*	*3.40*	*4.40*	*8 Lines*	*2.80*	*4.80*	*6.80*	*8.80*
5 Lines	*1.75*	*3.00*	*4.25*	*5.50*	*9 Lines*	*3.15*	*5.40*	*7.65*	*9.90*
6 Lines	*2.10*	*3.60*	*5.10*	*6.60*	*10 Lines*	*3.50*	*6.00*	*8.50*	*11.00*

CLASSIFIED DISPLAY RATES

Classified Display is set with a border and may be used in one or two column sizes.

1 Inch ..... 1 time $5.00
1 Inch ..... 13 times ..... 4.50 per inch
1 Inch ..... 26 times ..... 4.00 per inch
1 Inch ..... 52 times ..... 3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

For Sale—Equipment

FOR SALE: 1—Ideco Portable Standard Rig suitable for drilling, pumping, or servicing, complete less motor. I.T.I.O., Bartlesville, Okla

FOR SALE

One gasoline drilling rig with two 85 H.P. Waukesha motors and unitized draw works complete.

300 sets 3" A.P.I. tool joints.

10,000 Ft. 7" O.D. 26# seamless casing, once run.

15,000 Ft. 4½" O.D. seamless drill pipe equipped with both regular and full hole tool joints.

In addition to the above we have 20,000 Ft. of 6" screw line pipe in Oklahoma; also drilling rig capable of drilling to 6500 feet, complete stock of line pipe, casing, drilling and pumping equipment.

Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, La.

FOR SALE — At Oklahoma City — 11 6" and 8" Byron-Jackson built-in motor pump heads for use in operating deep-well turbine pumps. I. T. I. O. Company, Bartlesville, Oklahoma.

FOR SALE

ANY QUANTITY

NEW SEAMLESS STEEL COUPLINGS

750—13" O. D. (12½" Pipe) 8-V Thread x 8¼" long, Line, at $1.35 each.
3000—1¼" Black Merchant Forged Steel, at 4c each.
2500—1½" Black Merchant Forged Steel, at 5½c each.
6000—1¼" Galv. Merchant Forged Steel, at 5¼c each.

RECONDITIONED PIPE

30,000 feet 12", 50 lb. at $1.25 per foot.
80,000 feet 6" Std. at 38c per ft.
All of the above F.O.B. Philadelphia District, subject to prior sale. Pipe in lengths 18'0" and longer, plain ends.

EASTERN PIPE SUPPLY COMPANY
1424 N. NINTH STREET
PHILADELPHIA PENNA.

FOR SALE: 4 — OCS Roller Bearing Chain Driven Sand Reels. I. T. I. O., Bartlesville, Okla.

REFINERY GATE VALVES

Reconditioned and Tested
STEEL and CAST IRON
O.S.&Y. Flanged and Screw End
ALL STANDARD MAKES
Largest Stock in Midwest
We save you half

West Tulsa Pipe and Supply Co.
L.D. 635 P.O. Box 1665
TULSA, OKLAHOMA

FOR SALE—At Oklahoma City, Oklahoma, 25,000' ⅞" X 30' double pin used sucker rods, 5c per foot. I. T. I. O. Co., Bartlesville, Okla.

YOUR dependable and cheapest source of supply!
Tank & Freight Cars; any kind
Tank & Freight Car Repair Parts:
Locomotives; All Kinds
Relaying Rails

Perhaps *we* can supply your requirements and—immediately!
OTHER MACHINERY AND EQUIPMENT TOO!
Destination inspection if desired!

IRON & STEEL PRODUCTS, Inc.
36 years' experience
19412 S. Brainard Ave., Chicago, Ill.
"Anything containing IRON or STEEL"
Ask to be placed on our various mailing lists.

Equipment Wanted

Equipment Wanted

Equipment Wanted

WANTED TO BUY

All Sizes Storage Tanks—Wood or Steel Roof—10,000 bbl. to 80,000 bbl.
Abandoned Plants—Natural Gasoline, Oil Refineries, etc.
Send us lists of your surplus material and equipment

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry and H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

For Sale—Equipment

FOR SALE—At Seminole, Oklahoma—1 8' diameter X 26' gasoline steel storage tank. I. T. I. O. Company, Bartlesville, Oklahoma—$200.00.

USED OIL TRUCKS

Mack—Diesel train—6300 Gallons.
Diamond T—6 wheeler—3000 Gallons.
Diamond T—6 wheeler—1500 Gallons.
International—Completely equipped —1200 Gallons.
International A7F—10 to 15 ton—6 wheeler.
Diamond T Model 1600—10-12 tons 6 wheeler.
Diamond T Model 1203—10 ton—6 wheeler.
Diamond T—6 wheeler—2600 Gallons.
Fruehauf Trailer — 3000 Gallon tank.

National Truck Sales, Inc.
3315 Archer Avenue, Chicago, Ill.

FOR SALE: At Oklahoma City—9—80 HP 180 RPM 2 cycle type "10" Bessemer Engine Compressor units with tandem cylinders. I.T.I.O. Company, Bartlesville, Oklahoma.

FOR SALE: 2—165 Hp. Type 10 Bessemer Gas Engines with direct-connected compressors; 5—80 Hp. Type 8 Bessemer Gas Engines with direct-connected compressors. A. C. ASKEW, Box 73, Whittier Station, Tulsa, Okla.

Situations Wanted

CHIEF CHEMIST—Process Supervisor. M. I. T. graduate. Experienced in manufacture of gasoline, lube oils, greases, asphalts, waxes, specialties. Fifteen years' experience. Address Box A-300, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE PETROLEUM ENGINEER With ten years' experience in production and sales work wants connection with a producing company or a major servicing or supply company. American, 35 years old.

Box A-310
The Oil and Gas Journal
Tulsa, Okla.

CHEM. Eng. 10 yrs. experience in oil devel. refining, and operation. With to make change. Address Box A-330, The Oil and Gas Journal, Tulsa, Okla.

POSITION WANTED
PURCHASING AGENT, chemical engineer, 20 years' experience materials and equipment used in refinery or gas construction and operation. Box A-333, The Oil and Gas Journal, Tulsa, Oklahoma.

ACCOUNTANT, office manager, experienced in oil industry. Capable of handling income taxes, social security and wage and hour matters. Box A-332, The Oil and Gas Journal, Tulsa, Oklahoma.

Help Wanted

WANTED SALES REPRESENTATIVE
To sell well-known line of cast steel specialties, Crane Wheels, Conveyor Chain, Sprockets, Elevator Buckets, and similar parts. In reply advise lines you are now handling, district covered and previous experience. Address Box A-331, The Oil and Gas Journal, Tulsa, Oklahoma.

WELDING Engineer, graduate metallurgist with experience in fabrication procedure and welding practice. State acceptable salary. Battelle Memorial Institute, Columbus, Ohio.

Help Wanted

WANTED
SALESMEN

Geophysical Experience Desirable.

GEOLOGICAL SCIENTIFIC SERVICE CO., INC.
Sinclair Building
FORT WORTH, TEXAS

Mailing Lists

ROYALTY owners, Oil Investors, Unitholders, Stockholders in Oil and Royalty Companies. Personnel lists of every branch of oil industry. All by States. We buy lists. New catalogues ready. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Oklahoma.

Equipment Wanted

WANTED: Drilling bits, 24" or larger, 6" joints preferred. Also large Spudding or Cable-tool Drilling Machine. Machine with power unit attached preferred. Must be in first class condition. S. B. Geiger & Co., 37 W. Van Buren St., Chicago, Ill.

Geologic Survey

GEOLOGISTS—SURVEYORS

Looking for U. S. or State Geologic Surveys, or other government publications? Write Cornwall's Book Store, 723 Eleventh Street, Northwest, Washington, D. C. Unusually large stock.

Financing

DEVELOPMENT loan or advance negotiated on commission basis for a matter of exceptional merit. Box 5411, Philadelphia.

Ranches—Farm Lands

FOR SALE: Beautiful Historical California Ranch, 800 A. Semi modern, improved. Live Oaks, springs, etc. Good roads; 26 miles east San Diego. Snap $36,000. 2644 Rimpau Blvd., Los Angeles.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the January 2 issue All changes in crude-oil-price schedules will be published completely in the first issues following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):

East Texas	$1.10
Conroe	1.27
Tepetate, Louisiana	1.03
Smackover, Arkansas, heavy	.73
Illinois basin	1.15
Pecos County, Texas	.76
Lance Creek, Wyoming	.77
Bradford, Pennsylvania	2.15

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

	Hill, California* Signal	Oklahoma, Kansas	Coast, Texas Gulf
14-14.9	$0.65	....	....
15-15.9	.65	....	....
16-16.9	.65	....	....
17-17.9	.65	....	....
18-18.9	.65	....	....
19-19.9	.69	....	$0.86
20-20.9	.73	$0.70	.38
21-21.9	.78	.72	.90
22-22.9	.82	.74	.92
23-23.9	.86	.76	.94
24-24.9	.90	.78	.96
25-25.9	.95	.80	.98
26-26.9	.99	.82	1.00
27-27.9	1.03	.84	1.02
28-28.9	1.07	.86	1.04
29-29.9	1.10	.88	1.06
30-30.9	1.14	.90	1.08
31-31.9	....	.92	1.10
32-32.9	....	.94	1.12
33-33.9	....	.96	1.14
34-34.9	....	.98	1.16
35-35.9	....	1.00	1.18
36-36.9	....	1.02	1.20
37-37.9	....	1.04	1.22
38-38.9	....	1.06	1.24
39-39.9	....	1.08	1.26
40-40.9	....	1.10	1.28

*Effective Feb. 1, 1940.

Crude-Oil Price Changes

Sohio Corp. and other purchasers in southwestern Michigan have increased postings for Grand Rapids, Allegan, Kent, Ottawa, and Bloomingdale crudes 5 cents per barrel effective January 2. The new flat price at the fields is $1.23 per barrel. Other Michigan fields received a general advance of 10 cents per barrel 2 weeks ago, also effective January 2.

Republic Oil Refining Co., Houston, rescinded its crude-price reduction of 1 to 20 cents in Southwest Texas of December 5 and restored the previous schedule effective at 7 a.m. January 20.

Gulf Coast Markets

(Continued from Page 93)

fications continued to weaken, and one cargo moved at 74 cents. Other cargoes were quoted at 75 cents, although one source continued to hold out for 80 cents. The ready availability of this material from various sources at 75 cents established the latter definitely as a market. Among those selling at 75 cents are two of the major companies.

Easing up of tanker rates from Gulf ports to the Atlantic seaboard is bringing some relief to Gulf Coast refiners, although indications the past week were that the easing up may be only temporary.

Mississippi and Southeast

(Continued from Page 88)

Life Ins. Co., 36-21n-5e, resumed drilling 4,225 ft., old T.D. 3,479 ft.

Tishomingo County

Mellen & Gear 1 E. K. Wood, SE SE SE 21-4s-11e, S.D. 1,637 ft., shale and dolomite, top Knox dolomite 1,547 ft.

ALABAMA DRILLING REPORT

Fayette County

B. L. Fillingame 1 Ala. Educational Ass'n., NW SW 3-16s-12w, T.D. 1,553 ft., Pottsville sand 1,552 ft., flowing est. 2,000,000 cu. ft. gas through hole full of water.

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